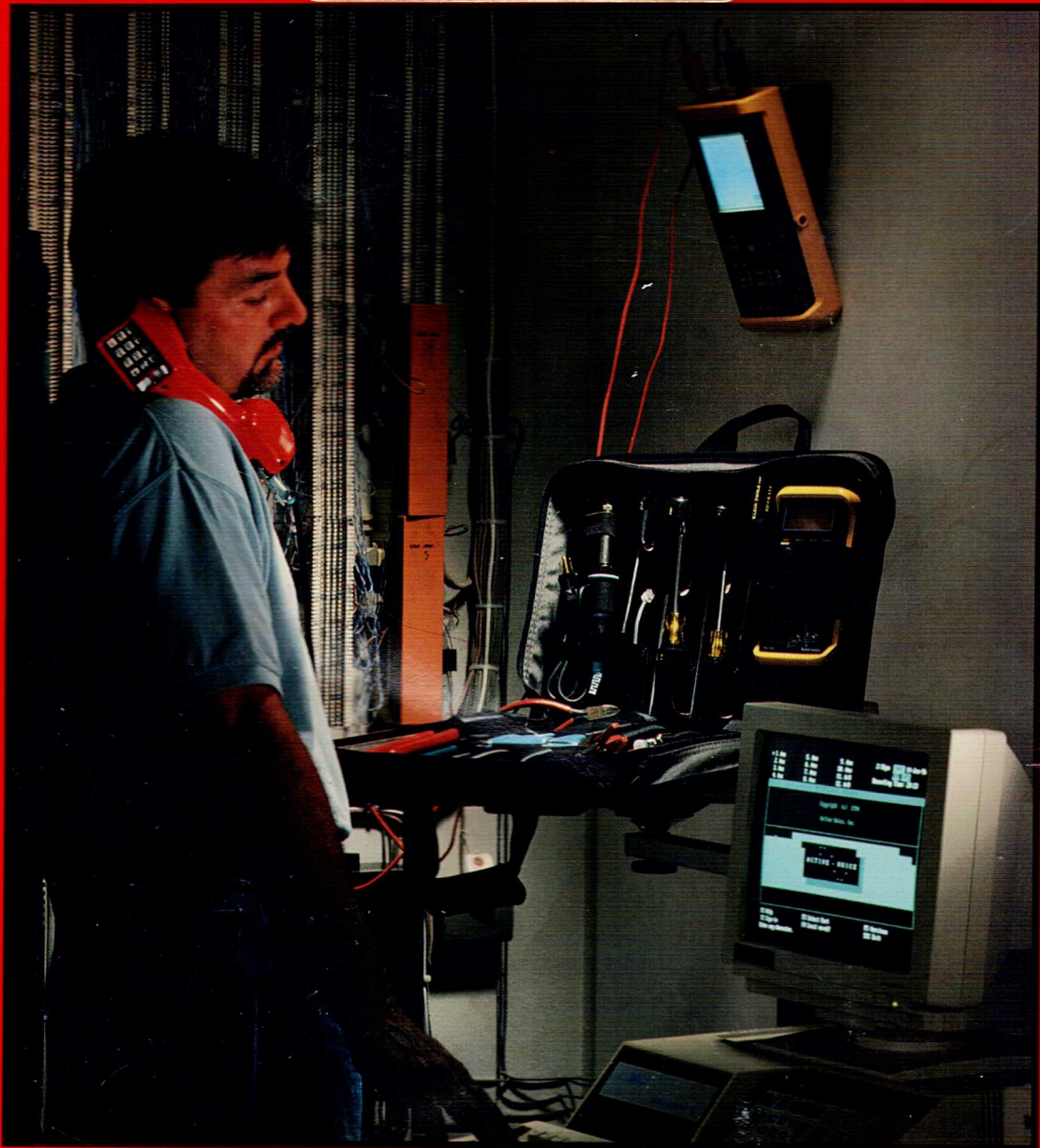


SPECIALIZED PRODUCTS COMPANY

For Orders/Quotations
by FAX:
FAX: USA 214-550-1386
e-mail: SPCompany@aol.com
Dallas, Texas - USA



Fall '96

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Product Guarantee

At Specialized Products Company, we stand behind everything we sell. If for any reason you are not completely happy with your purchase, return it to SPC within 30 days. We will exchange it or refund your money. Please contact the SPC Customer Service Department for a Return Authorization Number (RMA) before returning your purchase. Then send it in the original packaging with a copy of the packing list or invoice.

Every product you order from SPC carries a full factory warranty that guarantees it for an additional period of time. It could be 90 days, one year, five years or even a lifetime — depending on the product and the manufacturer. Please refer to specific product information in this catalog. Or contact the SPC Customer Service Department at (800) 866-5353 for more information about the exact duration and any possible limitations of individual factory warranties. Be assured that we want you to be completely satisfied with every SPC purchase.

SPECIALIZED PRODUCTS COMPANY

**TOLL-FREE PHONE NUMBER:
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For just a \$14.95 flat rate, Specialized Products will ship any order TODAY for NEXT-DAY delivery by 3 p.m. That's any size order to anywhere in the United States! Our warehouse stays open late in the evening to accommodate all standard time zones.

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Telephone (214) 550-1923 • FAX (214) 550-1386

e-mail: SPCcompany@aol.com

Pathfinder

Combination Wiring Tester and Wire Mapper

- One-man operation with high drop resistance
- Includes four water-resistant remote units
- Remote IDs work on all standard wiring formats (TP-PMD, 10BASE-T, USOC) and with wiring faults (robust)

This Ideal LAN wiring verifier quickly and reliably tests installed twisted-pair, coax cabling, USOC and other LAN-based cabling. The Pathfinder evaluates one- to four-pair cabling for reversals, opens, shorts, miswires and split pairs. Use it to test T568A, T568B, 10BASE-T, TP-PMD, Token Ring and USOC wiring schemes. It will test coax cabling for opens and shorts. Learn mode will learn and test installed custom or nonstandard wiring configurations. When a learned sequence is stored in memory, the Pathfinder can recognize it with a PASS and an audible tone. Learn mode can be reprogrammed over and over again. Use debug mode for debugging an installed cable. Another feature is tone generation on either coax or twisted-pair wiring. One pin/wire can be toned for individual wire tracing. Caution: do not connect to a live circuit. If this happens, the beeper will sound continuously, and all fail LEDs will flash in sequence to alert you to disconnect the Pathfinder immediately.

The master and four water-resistant remote units (A, B, C and D) are used to test twisted-pair wiring. Pathfinder uses 13 LEDs that display all test and status information, two RJ45 jacks for choosing a particular wiring scheme, one BNC jack for coax cable testing and two push-buttons for easy operation. Approximate test time is 1.5 seconds.

Test any chosen wire configuration including USOC. Most wiring configurations including 10BASE-T, Token Ring and TP-PMD are subsets of T568A or T568B. Pairs are located on the same RJ45 pins and differ only in pair numbering which leads to different color codes. This cable tester refers to pairs by RJ45 pin numbers (i.e., 1-2, 3-6, 4-5, 7-8).

The master unit has an automatic-off feature to prolong battery life. Remote units do not require batteries. The Pathfinder Kit includes master unit, four remotes (A, B, C and D), five modular cords wired straight through and 500-Ω terminator packaged in a gray carrying case. Order 62-080 for the Pathfinder coax/twisted-pair tester only. Remotes A-D also are available separately. One-year warranty.

370X455	33-812 Pathfinder Kit	.....1-5,	\$259.00 ea.; 6-up,	\$244.00 ea.
370X450	62-080 Tester Only	.....1-5,	131.00 ea.; 6-up,	124.00 ea.
370X451	62-081 Remote Unit A	.....	28.95 ea.	
370X452	62-082 Remote Unit B	.....	28.95 ea.	
370X453	62-083 Remote Unit C	.....	28.95 ea.	
370X454	62-084 Remote Unit D	.....	28.95 ea.	



Pathfinder Features

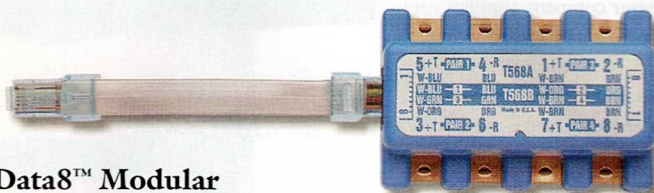
- | | | |
|--------------------------------|-------------------------|-------------------------------|
| • Tone | • Audible pass (beeper) | • Coax tone |
| • Split-pair detect | • Learn mode | • Over-voltage display |
| • Supports multiple standards | • Learn custom cable | • Low-battery detect |
| • Demand pass/fail (auto test) | • Debug with wire map | • Auto off |
| | • Coax testing | • Reference information label |

Data8™ Modular Test Adapter

Data Wired Modular Unit for Data Applications

Ideal's Data8™ Modular Test Adapter with straight-through data wiring construction allows testing of T568A, T568B, 10BASE-T, Token Ring and TP-PMD systems. Use it with tone generation, butt-in test sets and other test devices to provide access to data lines without service interruption. Put tone on a line to trace lines. An easy-to-read label indicates individual conductors and pins defined with number, color and polarity identifications. Large perforated test pads are arranged longitudinally, simplify easy connection and keep test probes or alligator clips attached. The label displays correct pin-out test pads for common wiring schemes. This tester provides EIA/TIA Category 5 jacks and a unique internal circuit design to reduce attenuation, coupling, jitter and signal distortion when testing data lines. Two eight-position, eight-wire receptacles allow in-line testing. A small hole in each sturdy copper contact is for test probe use. Includes replaceable test lead and sturdy stainless steel belt clip. One-year warranty.

370X458	62-098 Data8 Adapter1-11,	\$26.95 ea.; 12-up,	\$25.50 ea.
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Smart6™ Modular Tester

Telco Wired Modular Unit for Voice Circuit Applications

Smart6™ is a reverse-wired modular adapter designed especially for voice circuit testing. Use it with a tone probe or tone generator to put tone on a line to trace lines. Four bright LEDs display power, polarity, ac voltage conditions, jack addresses and incoming call identification for typical on-the-job applications. A test button tests one or two pairs (pins 4-5 and/or 3-6) for the presence of voltage on the line. It allows access to the circuit as a modular test adapter without disrupting service. Ring detection tests phone number and line. WALL direction identification eliminates guesswork. An easy-to-read information label identifies individual conductors and pins defined with number, color and polarity identifications. Large perforated test pads are arranged longitudinally, simplify easy connection and keep test probes or alligator clips attached. Test clips will not short out to each other. Two six-position, six-wire receptacles allow in-line testing. A small hole in each sturdy copper contact is for test probe use. Includes replaceable test lead and sturdy stainless steel belt clip. One-year warranty.

370X456	62-096 Smart6 Tester1-11,	\$29.95 ea.; 12-up,	\$28.50 ea.
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CUSTOM TOOL KITS



**Call Toll Free
(800) 866-5353**

Standard Tool Kits

Specialized Products Company offers over 70 off-the-shelf tool kit solutions to fit most requirements. Since 1973 we've furnished hundreds of thousands of tool kits to large and small firms throughout the world. On the next 40 pages, we showcase our most popular versions for applications as diverse as PC repair, Ethernet or 10BASE-T installation, telephone service, ESD-safe field repairs, clean room applications and much more. All our kits are designed and built with input from you — our customer. You told us you wanted high-quality, name-brand tools like Klein, Cooper and Stanley. So that's what you'll find in each kit. No off brands or private label tools are included, so you can order from us with confidence that you will get exactly what you pay for.

Modified Tool Kits

We recognize that your application or budget may require modifications to one of our standard tool kits, and we are happy to accommodate your needs. Maybe we've included some tools that you don't really need, or perhaps we didn't include some items that are essential to your particular application. Simply choose the standard tool kit closest to your needs, and call a Specialized Products Company sales representative toll free at (800) 866-5353. Let us know which tools you would like to take out or what you would like to add. Then we will create a special modified tool kit just for you. There is no extra charge for this option, and in most cases we can even ship your newly modified kit the same day you order it!

Custom Tool Kits

If your company supplies tool kits to a national service group, or if your requirements are so unique that none of our standard kits can be modified easily, we suggest SPC's custom tool kit option. We are well-equipped to build a completely custom tool kit to meet your exact specifications. We have access to literally hundreds of tool case/pallet styles and materials, and for a reasonable quantity, we can even custom build a case from scratch to your exact specifications! How's that for specialized service? Just call an SPC sales representative at (800) 866-5353 or FAX a list of your special requirements to (800) 234-8286. We'll gladly furnish you with a very competitive quote — and usually within 24 hours!



SPC-88 Series

Field Service Engineer Tool Kits

The SPC-88 Series of tool kits was our first and is still our most popular family of field service kits. Designed specifically to service a wide range of electronic equipment, these kits have proven themselves time and again in such diverse industries as computer field service, office products repair, automated process maintenance and medical equipment repair. In fact, the particular complement of tools included in our SPC-88s has become the standard of the industry. Almost 90 high-quality tools are supplied with each SPC-88 Series Tool Kit.

Everything the field engineer needs to install, service or repair sophisticated electronic equipment is conveniently arranged on two removable pallet surfaces. The range of tools has been carefully selected to include screwdrivers, nutdrivers, pliers/cutters, hex tools, a crimp tool, wire strippers, a soldering iron and retaining ring pliers. Also included are a complete socket set, knives, adjustable wrenches and alignment tools — just to list a few. For a complete list of what's in each SPC-88, please refer to the TOOLS list below.

We now offer the SPC-88 Series Tool Kits in a choice of 16 different case styles and sizes. In fact, we now offer case styles for virtually any application imaginable. Take a look at our new Mil-Type or Xenoy case styles that are proven to be virtually indestructible. Or the new Roto-Rugged cases



that are not only super durable but also available up to a full 10 inches deep. We have aluminum cases, yellow cases, inexpensive cases and even cases with built-in luggage carts. This is the most extensive selection ever to ensure that you are able to select the exact case you want for your individual requirements.

For complete tool case specifications, please refer to the Tool Case section of this catalog.

TOOLS

Flashlight
Electrician's Scissor
Adjustable Wrench, 4"
Adjustable Wrench, 8"
Alignment Tools, 2
Inspection Mirror
Reverse Action Tweezer
Soldering Aid
Scribe, Icepick Type
Socket Set, 1/4"
Screwdriver, 1/4" Slot 4" Long
Screwdriver, 1/8" Slot 8" Long

Screwdriver, 1/8" Slot 3" Long
Screwdriver, 3/16" Slot 3" Long
Screwdriver, 3/32" Slot 2" Long
Screwdriver, 5/16" Slot 6" Long
Stubby Slot Screwdriver
Phillips Screwdriver, #0, 2"
Phillips Screwdriver, #1, 3"
Phillips Screwdriver, #2, 4"
Stubby Phillips Screwdriver
Screwholding Slot Screwdriver
T Type Wire Stripper
Pocket Pack Solder, 60/40

Electrician's Knife
Diagonal Cutting Plier, 5"
Diagonal Cutting Plier, 4"
Midget Chain Nose Plier
Long Nose Plier w/ Cutter
Utility Plier, 10"
Offset Ratchet Screwdriver
Pocket Burnishers, 3
Center Punch, 1/4"
2 Pin Punches, 1/16" and 1/8"
Ball Pein Hammer, 4-oz.
Stripper/Cutter/Crimper Tool

External Retaining Ring Plier
Internal Retaining Ring Plier
Ignition Type Wrench
Metal Rule, 6"
Soldering Iron, 25-Watt
Thickness Gauge
Driver Handles, 2
9 Nutdriver Blades, 3/16" - 1/2"
9 Allen Hex Blades, .050" - 3/16"
6 Bristol Spine Blades, .048" - .096"
Jeweler's Screwdriver Set
Deluxe Attaché Case



SPC-88R and RD

Roto-Classic Case Models

These very attractive Roto-Classic case styles are some of the most popular models in our SPC-88 Series Field Engineer Tool Kits. The SPC-88R is supplied in our black #384 Roto-Classic polyethylene case that measures 17.75" x 12.75" x 6.5" (inside dimensions) and weighs 22 pounds with tools. Our SPC-88RD comes in the deep version #386 Roto-Classic case that measures 17.75" x 12.75" x 8.75" (inside dimensions) and weighs 23 pounds with tools.

Each model comes completely assembled with all the tools listed on the previous page. An optional Fluke 77 DMM is available. Either two-pallet case also may be ordered separately. Tools carry lifetime warranties; cases have one-year warranties.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88R	1	\$476.00 ea.	\$655.00 ea.	082X384
6" Roto-Classic	2-5	452.00 ea.	627.00 ea.	1-5 \$165.00 ea.
Case Model	6-11	429.00 ea.	599.00 ea.	6-24 150.00 ea.
SPC-88RD	1	\$486.00 ea.	\$665.00 ea.	082X386
8" Roto-Classic	2-5	462.00 ea.	637.00 ea.	1-5 \$175.00 ea.
Case Model	6-11	439.00 ea.	609.00 ea.	6-24 160.00 ea.

SPC-88K

Clean Room Case Model

Model SPC-88K is our clean room version kit supplied in our exclusive 082X634 case. We have specially designed this kit for clean room use that requires keeping particulate contamination to an absolute minimum. Our white 634 tool case measures 17.75" x 12.75" x 6" (inside dimensions) and weighs 22 pounds with tools. It features an anodized frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust and military-style (quarter-turn) latches.

This kit comes completely assembled with all the tools listed on the previous page. An optional Fluke 77 DMM is available. The two-pallet case also may be ordered separately. Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88K	1	\$515.00 ea.	\$694.00 ea.	082X634
Clean Room	2-5	489.00 ea.	664.00 ea.	1-5 \$220.00 ea.
Case Model	6-11	465.00 ea.	635.00 ea.	6-24 198.00 ea.

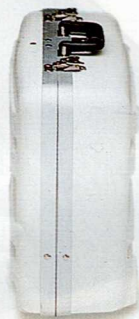
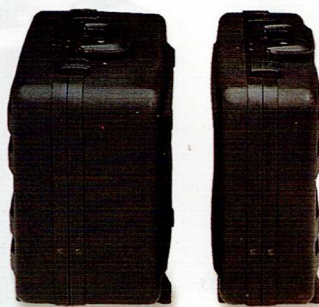
SPC-88Z

Zippered Attaché Case Model

New! Our SPC-88ZX is a very unique attaché-type tool kit in a padded, Cordura® zipper case. We've taken our most popular 88-style tool pallets and built a special soft-sided zipper-type tool case to accommodate them. The 082X788 case is a double-sided version that allows for an amazing amount of flexibility. It can be custom-configured to accommodate up to four tool pallets or two tool pallets and a notebook computer or a wide variety of test equipment and/or spares. The SPC-88ZX measures 18" x 6.75" x 14.25" and weighs 13 pounds with tools. It includes a detachable shoulder strap.

This kit comes completely assembled with all the tools listed on the previous page. An optional Fluke 77 DMM is available. The two-pallet case also may be ordered separately. Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88ZX	1	\$490.00 ea.	\$669.00 ea.	082X788
2-Sided Zipper	2-5	465.00 ea.	640.00 ea.	1-5 \$185.00 ea.
Case Model	6-11	442.00 ea.	612.00 ea.	6-24 166.00 ea.



SPC-88MD and XM

Standard Polypropylene Case Models

The SPC-88MD is supplied in our #216 standard depth polypropylene tool case that measures 17.75" x 12.75" x 6.5" (inside dimensions) and weighs 20 pounds. Our SPC-88XM comes in our #217 deep poly tool case that measures 17.5" x 12.5" x 7" (inside dimensions) and weighs 21 pounds. Black, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88MD	1	\$415.00 ea.	\$594.00 ea.	082X216
6" Std.	2-5	394.00 ea.	569.00 ea.	1-5 \$105.00 ea.
Case Model	6-11	375.00 ea.	545.00 ea.	6-24 95.00 ea.
SPC-88XM	1	\$425.00 ea.	\$604.00 ea.	082X217
7.5"	2-5	404.00 ea.	579.00 ea.	1-5 \$110.00 ea.
Case Model	6-11	385.00 ea.	555.00 ea.	6-24 99.00 ea.

SPC-88HD and HX

Standard Polyethylene Case Models

Model SPC-88HD is supplied in our #416 standard depth polyethylene tool case that measures 18.25" x 13" x 7" (inside dimensions) and weighs 21 pounds. Our SPC-88HX comes in our #417 deep polyethylene tool case that measures 18.25" x 13" x 8.5" (inside dimensions) and weighs 22 pounds. Light gray, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88HD	1	\$430.00 ea.	\$609.00 ea.	082X416
7" Gray	2-5	409.00 ea.	584.00 ea.	1-5 \$115.00 ea.
Case Model	6-11	390.00 ea.	560.00 ea.	6-24 104.00 ea.
SPC-88HX	1	\$440.00 ea.	\$619.00 ea.	082X417
8" Gray	2-5	419.00 ea.	594.00 ea.	1-5 \$125.00 ea.
Case Model	6-11	400.00 ea.	570.00 ea.	6-24 112.00 ea.

SPC-88SHD and SHX

Super Heavy-Duty Polyethylene Case Models

The SPC-88SHD is supplied in our #436 standard depth polyethylene tool case that measures 17.25" x 13.75" x 7" (inside dimensions) and weighs 22 pounds. Our SPC-88SHX comes in our #439 deep polyethylene tool case that measures 17.25" x 13.75" x 9" (inside dimensions) and weighs 23 pounds. Black, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88SHD	1	\$449.00 ea.	\$628.00 ea.	082X436
7" Black	2-5	426.00 ea.	601.00 ea.	1-5 \$125.00 ea.
Case Model	6-11	405.00 ea.	575.00 ea.	6-24 113.00 ea.
SPC-88SHX	1	\$459.00 ea.	\$638.00 ea.	082X439
9" Black	2-5	436.00 ea.	611.00 ea.	1-5 \$135.00 ea.
Case Model	6-11	415.00 ea.	595.00 ea.	6-24 121.00 ea.

SPC-88AG

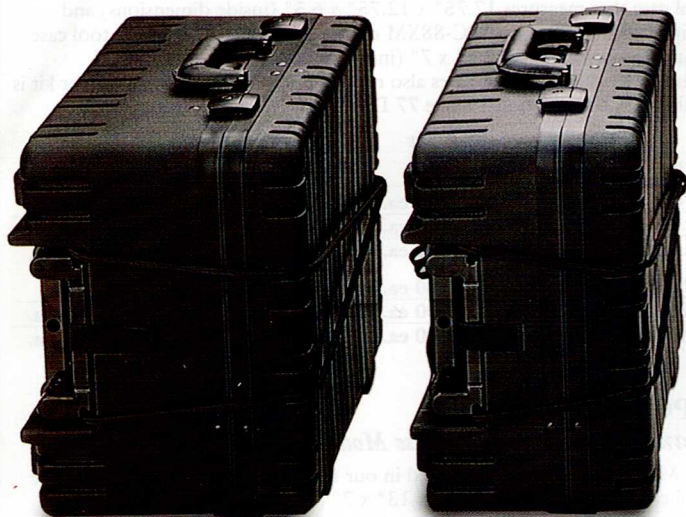
Indestructible Xenoy Case Model

The most durable tool case we sell! Military-style hardware, water-proof gasketing, stainless steel hardware, even a pressure relief valve are just some of the features of this unique case. The SPC-88AG is supplied in our #905 Xenoy thermoplastic case that measures 19" x 10.5" x 7" (inside dimensions) and weighs 22 pounds. The charcoal gray, two-pallet case also may be purchased separately. Kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88AG	1	\$569.00 ea.	\$748.00 ea.	700X905
7" Xenoy	2-5	540.00 ea.	715.00 ea.	1-5 \$279.00 ea.
Case Model	6-11	514.00 ea.	684.00 ea.	6-24 252.00 ea.

For complete tool case specifications, please refer to the Tool Case section of this catalog.





SPC-88C

Field Service Kit with Built-in Luggage Cart

Sometimes an idea seems so simple and logical that it's hard to believe it's taken so long for anyone to notice it! Our SPC-88C is just such an idea. We married our all-time best-selling field engineer kit with our most popular luggage cart. In fact, we built the cart right into the case so it's always there when you need it. Just pile on the extra cases or gear, flip up the handles, lock the bar in place, and you're on your way!

There is no assembly required and no loose parts to keep up with. The case itself is a special version of our popular heavy-duty polyethylene tool case that is modified to accommodate a rugged cart assembly. Low profile rubber wheels are permanently mounted to the side edge of the case for smooth rolling, and their small size makes them hard to notice unless you're looking for them. The handles are recessed into the other side and are flush with the case when collapsed. We've even added a couple of small metal rails to the underside of the case to protect it from stair or curb damage. Finally, all the guts of the cart are cleverly hidden under a removable plastic tray below the bottom pallet of tools.



The SPC-88C tool complement is arranged on two removable pallet surfaces and features our standard SPC-88 Series tool selection. Now available in two sizes. Our original SPC-88C is supplied in the 516P which measures 17.75" x 14.5" x 9.5" (inside dimensions), weighs about 29 pounds (complete) and has between 3.5" and 5" of usable space below the bottom pallet. Our new low-profile version, SPC-88CS comes in our 514 case that measures 17.75" x 14.5" x 7.5" (inside dimensions), weighs 28 pounds and has 2" to 4" of usable space below the bottom pallet. The tools come with a life-time guarantee, and the case has a one-year warranty. Available in black only. Either kit may be ordered with an optional Fluke 77 DMM. Of course, either case may be ordered without tools also.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88C	1	\$595.00 ea.	\$774.00 ea.	082X516
9" Luggage Cart	2-5	565.00 ea.	740.00 ea.	1-5 \$285.00 ea.
Case Model	6-11	536.00 ea.	706.00 ea.	6-24 265.00 ea.
SPC-88CS	1	\$585.00 ea.	\$764.00 ea.	082X514
7" Luggage Cart	2-5	555.00 ea.	730.00 ea.	1-5 \$280.00 ea.
Case Model	6-11	528.00 ea.	698.00 ea.	6-24 260.00 ea.

TOOLS

Flashlight
Electrician's Scissor
Adjustable 4" Wrench
Adjustable 8" Wrench
Alignment Tools, 2
Inspection Mirror
Reverse Action Tweezer
Soldering Aid
Scribe, Icepick Type
Socket Set, 1/4"
Screwdriver, 1/4" Slot 4" Long
Screwdriver, 1/8" Slot 8" Long

Screwdriver, 1/8" Slot 3" Long
Screwdriver, 3/16" Slot 3" Long
Screwdriver, 3/32" Slot 2" Long
Screwdriver, 5/16" Slot 6" Long
Stubby Slot Screwdriver
Phillips Screwdriver, #0, 2"
Phillips Screwdriver, #1, 3"
Phillips Screwdriver, #2, 4"
Stubby Phillips Screwdriver
Screwholding Slot Screwdriver
T Type Wire Stripper
60/40 Pocket Pack Solder

Electrician's Knife
Diagonal Cutting Plier, 5"
Diagonal Cutting Plier, 4"
Midget Chain Nose Plier
Long Nose Plier w/ Cutter
Utility Plier, 10"
Offset Ratchet Screwdriver
Pocket Burnisher, 3
Center Punch, 1/4"
2 Pin Punches, 1/16" and 1/8"
Ball Pein Hammer, 4-oz.
Stripper/Cutter/Crimper Tool

External Retaining Ring Plier
Internal Retaining Ring Plier
Ignition Type Wrench
Metal Rule, 6"
Soldering Iron, 25-Watt
Thickness Gauge
Driver Handles, 2
9 Nutdriver Blades, 3/16" - 1/2"
Allen Hex Blades, .050" - 3/16"
6 Bristol Spine Blades, .048" - .096"
Jeweler's Screwdriver Set
Deluxe Attaché Case





SPC-88MLG and MLB HD Military-Style Case Models

The SPC-88MLG is supplied in our #552 olive-green Mil-Style polyethylene tool case that measures 17.5" x 13.5" x 9.5" (inside dimensions) and weighs 24 pounds. Our SPC-88MLB comes in our #554 black Mil-Style polyethylene tool case that measures 17.5" x 13.5" x 9.5" (inside dimensions) and weighs 24 pounds. Both two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88MLG	1	\$495.00 ea.	\$674.00 ea.	082X552
<i>Olive-Green</i>	2-5	470.00 ea.	645.00ea.	1-5 \$160.00 ea.
<i>Case Model</i>	6-11	446.00 ea.	616.00 ea.	6-24 144.00 ea.
SPC-88MLB	1	\$495.00 ea.	\$674.00 ea.	082X554
<i>Black</i>	2-5	470.00 ea.	645.00 ea.	1-5 \$160.00 ea.
<i>Case Model</i>	6-11	446.00 ea.	616.00 ea.	6-24 144.00 ea.

SPC-88WD and WX Durable Roto-Rugged Case Models

Model SPC-88WD is supplied in our #480 Roto-Rugged polyethylene tool case that measures 17.5" x 14" x 6" (inside dimensions) and weighs 24 pounds. Our SPC-88WX comes in our #482 Roto-Rugged polyethylene tool case that measures 17.5" x 14" x 10" (inside dimensions) and weighs 25 pounds. Black, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88WD	1	\$475.00 ea.	\$654.00 ea.	082X480
<i>6" Roto-Rugged</i>	2-5	450.00 ea.	625.00 ea.	1-5 \$155.00 ea.
<i>Case Model</i>	6-11	429.00 ea.	599.00 ea.	6-24 140.00 ea.
SPC-88WX	1	\$485.00 ea.	\$664.00 ea.	082X482
<i>10" Roto-Rugged</i>	2-5	460.00 ea.	635.00 ea.	1-5 \$165.00 ea.
<i>Case Model</i>	6-11	439.00 ea.	609.00 ea.	6-24 149.00 ea.

SPC-88AL and AX Professional Aluminum Case Models

The SPC-88AL is supplied in our #077 deluxe 6" aluminum tool case that measures 17.5" x 12.75" x 6" (inside dimensions) and weighs 21 pounds. Our SPC-88AX comes in our #177 deep deluxe aluminum tool case that measures 17.5" x 12.75" x 8" (inside dimensions) and weighs 22 pounds. These beautiful silver, two-pallet aluminum cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88AL	1	\$549.00 ea.	\$728.00 ea.	082X077
<i>6" Aluminum</i>	2-5	521.00 ea.	696.00ea.	1-5 \$244.00 ea.
<i>Case Model</i>	6-11	495.00 ea.	665.00 ea.	6-24 224.00 ea.
SPC-88AX	1	\$589.00 ea.	\$768.00 ea.	082X177
<i>8" Aluminum</i>	2-5	559.00 ea.	734.00 ea.	1-5 \$295.00 ea.
<i>Case Model</i>	6-11	532.00 ea.	702.00 ea.	6-24 270.00 ea.

SPC-88HY High-Visibility, HD Polyethylene Case Model

Model SPC-88HY features the dielectric yellow color that is the international symbol for safety. It is supplied in our #427 heavy-duty polyethylene tool case that measures 17.5" x 14.5" x 7.25" (inside dimensions) and weighs 23 pounds. The yellow, two-pallet case also may be purchased separately. Kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-88HY	1	\$455.00 ea.	\$634.00 ea.	082X427
<i>7" Yellow Poly</i>	2-5	432.00 ea.	607.00ea.	1-5 \$145.00 ea.
<i>Case Model</i>	6-11	410.00 ea.	580.00 ea.	6-24 130.00 ea.

For complete tool case specifications, please refer to the Tool Case section of this catalog.





SPC-95 Series Comprehensive Inch/Metric Service Kits

These special tool kits were designed and built for the service technician who works on a wide variety of equipment. We've taken the most common fastening tools used in the industry and packaged them in this one, comprehensive kit.

The SPC-95 Series includes inch and metric nutdrivers, ball-end hex drivers and combination wrenches plus a complete set of Torx™ drivers, receptacle analyzer, soldering/desoldering tools and a complete selection of standard screwdrivers, pliers and cutters, adjustable wrench and much more. See TOOLS below for complete list of kit contents.

What makes these kits really special is the innovative winged pallet design that looks and works like no other. Over 100 individual tools are mounted completely on two pallets.

By attaching two additional winged pallet surfaces to the top pallet, we've been able to put an incredible number of tools at your fingertips. For added convenience, we've arranged all of the inch-type tools on one wing with their corresponding metric equivalents on the other.

By design, SPC-95 Series Tool Kits are the most versatile sets of their kind anywhere. A wide selection of tools and the unique pallet design combine to make these kits particularly useful to anyone responsible for servicing third-party or systems-type equipment that uses a diverse assortment of fasteners. Choose from two heavy-duty polyethylene cases and two extra rugged mil-style shipping models.

TOOLS

Spline Key Set, 10-pc. .033"-.110"
Combination Crimp Tool
Inspection Mirror
Ball-End Hex Set, 5/64" - 3/16"
Ball-End Hex Set, 1.5-5 mm
Combination Wrench Set, 5-pc. 3/8" - 5/8"
Combination Wrench Set, 5-pc.
8 mm-15 mm
Bench-Type Brush, Soft
Alignment Tools, 2
Center Punch
Pin Punch, 1/10"
Pin Punch, 1/8"

Ball Pein Hammer, 4-oz.
Hand Reamer, 1/8" - 3/8"
Screwstarting Screwdriver
Wire Stripper, 10-18 AWG
Wire Stripper, 22-32 AWG
Receptacle Analyzer
Combination Spring Hook Tool
Pocket Pack/Solder
Reversible Retaining Ring Plier
Contact Burnishers, 3
Desoldering Tool
Electrician's Scissor
Hemostat, Straight 6"

Adjustable Wrench, 4"
Adjustable Wrench, 8"
Soldering Iron, 25-Watt
Chain Nose Plier, 4 1/2"
Diagonal Cutting Plier, 4"
Diagonal Cutting Plier, 5"
Utility Plier, 10"
Long Nose Plier w/ Cutter
Vise Grip Plier, Small
Precision Knife
Regular Blade Handle
Ratcheting Blade Handle
Nutdriver Blades, 9-pc. 3/16" - 1/2"

Nutdriver Blades, 9 pc. 4-10 mm
Slot Screwdriver, 1/4" x 4"
Slot Screwdriver, 1/8" x 2"
Slot Screwdriver, 1/8" x 8"
Slot Screwdriver, 3/16" x 3"
Slot Screwdriver, 5/16" x 6"
Stubby Slot Screwdriver, 1/4"
Stubby Phillips Screwdriver, #2 pt.
Phillips Screwdriver, #0 pt.
Phillips Screwdriver, #1 pt.
Phillips Screwdriver, #2 pt.
Torx™ Driver Set, 6-pc. T10-T30
Wing Pallet, Foam-Filled Case



SPC-95

Heavy-Duty Polyethylene Kits

A special heavy-duty polyethylene material with extra-deep exterior ridges (ribs) makes these tool cases almost indestructible. A full 4 inches of diced foam in the bottom cushions any of your delicate equipment transported to or from the job site. (Foam can be removed easily if not required.)

SPC-95 Series Tool Kits come in two colors of sturdy polyethylene. The standard black SPC-95 (082X595) is one of our most popular kits. SPC-95Y (082X495) is high-visibility yellow, the easy-to-identify international color for safety.

These 28-pound kits are 17.25" x 13.75" x 9" (ID). Fluke 77 DMM optional. Tools come with lifetime warranties; cases have one-year warranties.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-95	1	\$596.00 ea.	\$775.00 ea.	082X595
<i>Black Poly</i>	2-5	\$66.00 ea.	\$74.00 ea.	1-5 \$175.00 ea.
<i>Case Model</i>	6-11	\$58.00 ea.	\$70.00 ea.	6-up \$162.00 ea.
SPC-95Y	1	\$605.00 ea.	\$784.00 ea.	082X495
<i>Bright Yellow</i>	2-5	\$75.00 ea.	\$750.00 ea.	1-5 \$195.00 ea.
<i>Case Model</i>	6-11	\$46.00 ea.	\$716.00 ea.	6-up \$180.00 ea.



SPC-95 Mil-Style Kits

Mil-style cases are designed for government agencies or those who desire more rugged cases for frequent shipping. Each features mil-style quarter-turn fasteners, combination lock, padlock hasp and black anodized valance with full-length piano hinge. Raised corners provide additional protection during shipping and handling.

SPC-95 Series kits come in two colors of sturdy mil-style cases. Choose SPC-95MLG (082X572) in olive-drab green or SPC-95MLB (082X574) in black. Both include a full 4 inches of diced foam below the bottom pallet to cushion delicate equipment or parts.

These 24-pound kits are 17.25" x 13.75" x 9.5" (inside dimensions). Fluke 77 DMM optional. Tools come with lifetime warranties; cases have one-year warranties.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-95MLG	1	\$605.00 ea.	\$784.00 ea.	082X572
<i>Olive-Green</i>	2-5	\$75.00 ea.	\$750.00 ea.	1-5 \$185.00 ea.
<i>Case Model</i>	6-11	\$46.00 ea.	\$716.00 ea.	6-24 \$172.00 ea.
SPC-95MLB	1	\$605.00 ea.	\$784.00 ea.	082X574
<i>Black</i>	2-5	\$75.00 ea.	\$750.00 ea.	1-5 \$185.00 ea.
<i>Case Model</i>	6-11	\$46.00 ea.	\$716.00 ea.	6-24 \$172.00 ea.



SPC-95K

Clean Room Style Kit

Model SPC-95K is our clean room version kit supplied in our exclusive 082X695 case. We have specially designed this kit for clean room use that requires keeping particulate contamination to an absolute minimum. Our white 695 tool case features an anodized frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust, a combination lock as well as keyed latches. *Note: to prevent contamination, the layered foam has been removed from the bottom of this case.*

This 28-pound kit is 17.25" x 13.75" x 9" (ID). An optional Fluke 77 DMM is available. Tool case also may be ordered separately. Tools come with lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-95K	1	\$615.00 ea.	\$794.00 ea.	082X695
<i>Clean Room</i>	2-5	\$85.00 ea.	\$760.00 ea.	1-5 \$210.00 ea.
<i>Case Model</i>	6-11	\$55.00 ea.	\$725.00 ea.	6-24 \$189.00 ea.





SPC-66 Series Deluxe Field Service Tool Kits

The SPC-66 Series Tool Kits are the most complete field service kits available anywhere. We recognize the fact that the field engineer can often be confronted with unexpected tool requirements on even the most routine of jobs. This is why we've selected over 125 of our most often specified tools to go in each of our SPC-66 Tool Kits. You can be assured that the tool you need will always be at hand, preventing costly and unnecessary down time on the job.

Each of these kits is really special. We've custom-designed our cases to accommodate three complete (and removable) tool pallet surfaces so all tools are easy to see, immediately recognizable and always at your fingertips. And what a selection of tools it is! We started with the basics: a complete range of screwdrivers, nutdrivers, hex and spline drivers, pliers/cutters, a wire stripper, retaining ring tools, crimper, soldering iron, adjustable wrenches and on and on.

We've added many special but equally useful items such as small parts boxes, assorted tweezers, desoldering equipment, a complete set of open-end wrenches, vise grip pliers, a bench brush and much more. Over 125 tools are positioned on three removable pallet surfaces. For a complete listing of SPC-66 Series contents, please refer to the TOOLS list below.



TOOLS

Penlight, Disposable
Electrician's Scissors
2 Adjustable Wrenches, 4" and 8"
2 Alignment Tools
Inspection Mirror
Reverse-Action Tweezer
Jeweler's Screwdriver Set
Soldering Aid
Soldering Brush
Hook Scribe
Socket Set, 1/4" Drive
Screwdriver, 1/4", 4" Slotted Blade
Screwdriver, 1/8", 3" Slotted Blade
Screwdriver, 3/16", 3" Slotted Blade
Screwdriver, 3/32", 2" Slotted Blade
Screwdriver, 5/16", 6" Slotted Blade
Phillips Screwdriver, #0 pt., 2" Blade

Phillips Screwdriver, #1 pt., 3" Blade
Phillips Screwdriver, #2 pt., 4" Blade
Slot Screwdriver, Stubby
Phillips Screwdriver, Stubby
Wire Stripper, 22-32 AWG
Screwholding Screwdriver, Slot
Screwholding Screwdriver, Phillips
Solder Pak, 60/40
Stripper-Cutter-Crimping Tool
Electrician's Knife
Diagonal Cutting Plier, 5"
Midget Chain Nose Plier
Long Nose Plier w/ Cutter
Diagonal Cutting Plier, 4"
Utility Plier, 10"
2 Contact Burnishers
Center Punch

Ball Pein Hammer, 4-oz.
Pin Punch, 1/16"
Pin Punch, 1/8"
External Retaining Ring Plier
Internal Retaining Ring Plier
Ignition Wrench Set, 8-pc.
Metal Scale, 6"
Soldering Iron, 25-Watt
Thickness Gauge
Regular Handle
Junior Handle
9 Nutdriver Blades, 3/16" - 1/2"
9 Allen Hex Blades, .050 - 3/16"
6 Spline Blade Set, .048-.096"
Offset Ratchet Screwdriver
Desoldering Braid, 2 Sizes
Bench-Type Cleaning Brush

Soldapult Desoldering Tool
Lever Wrench Pliers
Swivel Head Pin Vise
Straight Point Tweezer
Angle Point Tweezer
Needle File Set, 3-pc.
Surgical Hemostats, 5"
Automatic Center Punch
Triple Tap Tool
Scratch Awl, Stubby
Straight Handle Ratchet
Spring Push Tool
Spring Pull Tool
Component Lead Bender
5-pc. Wrench Set, 3/8" - 5/8"
Plastic Parts Box
Attaché Tool Case I





SPC-66MD

Standard Polypropylene Case Model

SPC-66MD is our original, standard SPC-66 Deluxe Field Service Kit presented in our 082X218 injection-molded polypropylene plastic case. It has become the favorite of field personnel for both its exceptional durability and professional good looks. The most popular model in this series, its attractive price represents an unbeatable value.

Model SPC-66MD comes completely assembled with all the tools listed on the previous page. This 27-pound kit is 17.5" x 12.5" x 7.25" (inside dimensions). Kit may be ordered with an optional Fluke 77 DMM. The case also is available separately. Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM
SPC-66MD	1	\$600.00 ea.	\$779.00 ea.
<i>Black Polypropylene</i>	2-5	570.00 ea.	745.00 ea.
<i>Case Model</i>	6-11	542.00 ea.	712.00 ea.

Tool Case Only (No Tools)

082X218 Case 1-5, \$125.00 ea.; 6-24, \$113.00 ea.



SPC-66HY

High-Visibility, HD Polyethylene Case Model

Model SPC-66HY is our high-visibility yellow SPC-66 Tool Kit. Our 082X428 heavy-duty polyethylene tool case features the very visible dielectric yellow color, the international symbol for safety. This case was an instant hit with customers who really want to distinguish their tool kit from all the other carrying cases they use.

SPC-66HY comes completely assembled with all the tools listed on the previous page. This 28-pound kit measures 17.5" x 14" x 8.75" (inside dimensions). Kit may be purchased with an optional Fluke 77 DMM. The case also is available separately. Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM
SPC-66HY	1	\$629.00 ea.	\$808.00 ea.
<i>Yellow Polyethylene</i>	2-5	598.00 ea.	773.00 ea.
<i>Case Model</i>	6-11	568.00 ea.	738.00 ea.

Tool Case Only (No Tools)

082X428 Case 1-5, \$165.00 ea.; 6-24, \$150.00 ea.



SPC-66K

Clean Room Case Model

The SPC-66K is our clean room version kit supplied in our exclusive 082X618 case. We have specially designed this kit for clean room use that requires keeping particulate contamination to an absolute minimum. Our white 618 tool case features an anodized frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust, a combination lock as well as keyed latches.

Model SPC-66K comes completely assembled with all the tools listed on the previous page. This 28-pound kit measures 17.5" x 14" x 8.75" (inside dimensions). Kit may be purchased with an optional Fluke 77 DMM. The case also is available separately. Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM
SPC-66K	1	\$669.00 ea.	\$848.00 ea.
<i>Clean Room</i>	2-5	635.00 ea.	810.00 ea.
<i>Case Model</i>	6-11	603.00 ea.	773.00 ea.

Tool Case Only (No Tools)

082X618 Case 1-5, \$205.00 ea.; 6-24, \$185.00 ea.



SPC-66HD

Heavy-Duty Polyethylene Case Model

Model SPC-66HD is our SPC-66 Deluxe Field Service Tool Kit version that comes in a heavy-duty case. The 082X418 gray polyethylene tool case is very popular with everyone who needs a sturdy method for occasionally shipping a complete tool kit or carrying it into hazardous environments. The SPC-66HD is truly designed to withstand the rigors of working in the field. This virtually indestructible model will withstand rough handling and won't deteriorate under extreme temperatures. It will protect the popular selection of tools conveniently organized on three removable pallets inside.

The SPC-66HD comes completely assembled with all the SPC-66 Series tools listed previously. Its gray color is unobtrusive yet attractive. This 27-pound kit measures 18.25" x 13" x 8.5" (inside dimensions). Tools carry lifetime warranties; the case has a one-year warranty. A Fluke 77 DVM is optional. The heavy-duty tool case is also available separately.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DVM
SPC-66HD	1	\$610.00 ea.	\$789.00 ea.
<i>Gray Polyethylene</i>	2-5	579.00 ea.	754.00 ea.
<i>Case Model</i>	6-11	550.00 ea.	720.00 ea.

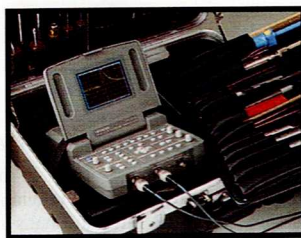
Tool Case Only (No Tools)

082X418 Case.....1-5, \$145.00 ea.; 6-24, \$132.00 ea.

SPC-66HS

Heavy-Duty Polyethylene Case Model with Scope Tray

This is our special version SPC-66 Tool Kit that accommodates a mini oscilloscope. Constructed of heavy-duty polyethylene, our 082X238 case is not only unusually functional but also virtually indestructible. What really distinguishes the SPC-66HS case from all



others is its ability to accommodate the Hitachi VC-5410 Oscilloscope. The addition of a handy pop-up tray in the bottom of this case allows the scope (or other small pieces of test equipment) to be used without being removed from the case! This tray also acts as a secure tie-down for the instrument to help protect it from damage while being transported.

Model SPC-66HS comes completely assembled with all the tools listed previously. The 29-pound kit measures 18" x 14.75" x 9" (inside dimensions). Tools carry lifetime warranties; the case has a one-year warranty. It may be purchased with an optional Fluke 77 DVM or Hitachi VC-5410 Mini Oscilloscope. This special case is also available separately.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DVM	Tool Kit w/ VC-5410
SPC-66HS	1	\$650.00 ea.	\$829.00 ea.	\$2240.00 ea.
<i>Black Polyethylene</i>	2-5	618.00 ea.	793.00 ea.	2173.00 ea.
<i>w/ Scope Tray Case</i>	6-11	587.00 ea.	757.00 ea.	2102.00 ea.

Tool Case Only (No Tools)

082X238 Case.....1-5, \$155.00 ea.; 6-24, \$140.00 ea.

SPC-66MLB

Heavy-Duty Military-Style Case Model

SPC-66MLB is supplied in our 082X534 sturdy black Mil-Style polyethylene tool case. This heavy-duty version is designed for government agencies or those who desire a more rugged case for frequent shipping. It features mil-style quarter-turn fasteners, combination lock, padlock hasp and black anodized valance with full-length piano hinge. The complete field service tool selection is always at your fingertips on three removable pallets. Raised corners provide additional protection during shipping and handling.

Model SPC-66MLB comes completely assembled with the complete selection of tools listed previously. It is black in color. The 29-pound kit measures 17.5" x 13.75" x 9.5" (inside dimensions). Tools carry lifetime warranties; the case has a one-year warranty. This kit may be purchased with an optional Fluke 77 DVM. The case is also available separately.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DVM
SPC-66MLB	1	\$630.00 ea.	\$809.00 ea.
<i>Mil-Style</i>	2-5	599.00 ea.	774.00 ea.
<i>Case Model</i>	6-11	570.00 ea.	740.00 ea.

Tool Case Only (No Tools)

082X534 Case.....1-5, \$180.00 ea.; 6-24, \$164.00 ea.





SPC-79 Series Ultimate Field Service Tool Kits

We consider our new family of SPC-79 tool kits to be the ultimate field service kits. We've taken our already industry standard tool kits and updated them for today's service environment. Whether your requirement is PC repair, biomedical service, network maintenance or likely a combination of all these and more — our SPC-79 kits are the solution.

Of course, all the basic tools are included: an extensive selection of interchangeable blade screwdrivers, nut-drivers and Torx® with standard and ratcheting handles plus a complete selection of pliers and cutters, crimp tools and wire strippers. Our SPC-79s also come standard with hex

wrenches, adjustable wrenches, professional soldering iron, tape measure, knives and miniature wrenches. But that's only the beginning. We

have added a DB25 universal patch cable and gender changers plus a selection of twisted-pair (RJ11 and RJ45) patch cords and couplers. There is also a receptacle analyzer, comprehensive static-control field service kit (with wriststrap), a large assortment of cable ties, some parts boxes and

IBM's Modem Tester. For a complete list of contents, refer to the TOOLS chart below.

All of these tools are carefully arranged on two removable pallet surfaces. We offer nine different case/size configurations to offer you the widest possible selection. Choose from our very popular heavy-duty black polyethylene (SHD and SHX) cases, our unique luggage cart case (C), two different sized aluminum (AL and AX) cases, black Roto-Classic (R and RD) cases and Roto-Rugged (WD and WX) cases.

TOOLS

Metal Scale, 6"
Standard Hex Key Set, 15-pc.
Metric Hex Key Set, 7-pc.
Utility Pliers, 6" and 10"
Small Chain Nose Pliers, 4"
Small Diagonal Cutting Pliers, 4"
Anti-Static Desoldering Tool
Jeweler's Screwdriver
Comb. Offset Ratchet Screwdriver
Reverse Action Tweezer
Combination Spring Hook Tool
Pocket Pak of Solder
Electrician's Scissors
Straight Hemostat, 5"
Adjustable Wrenches, 4" and 8"

Combination Pocket Screwdriver
English/Metric Tape Measure, 12'
Ball Pein Hammer
Inspection Mirror with Magnet
Standard Diag. Cutting Pliers, 5"
Long Nose Pliers w/ Cutter, 6"
Professional Soldering Iron, 25-Watt
Precision Knife
Regular Blade Handle
Ratcheting Tee Handle
Blade Extensions, 4" and 7"
Nutdriver Blades, 3/16" - 1/2"
Slot Screwdriver Blades, 1/8", 1/4", 3/16"
Phillips Screwdriver Blades,
#0, #2, #3

Torx® Blades, T10, T15, T20
Large Slot Screwdriver, 5/16"
Large Phillips Screwdriver, #3
Slot-Type Screwholding Screwdriver
Phillips-Type Screwholding
Screwdriver
Multi-Purpose Crimp Tool
Penlight Flashlight
Electrical Tape, 1 roll
Instrument Oiler, 2-oz.
Alignment Tool/Trimpot Adjuster
Small Visegrip Pliers, 5"
Miniature Open End Wrench Set,
7/32" - 7/16"
All-Weather Extension Cord, 10'

Wire Stripper, 16-26 AWG
Wire Stripper, 22-31 AWG
Receptacle Analyzer w/ Ground
Universal DB25 Cable, 8'
DB25 Gender Changer, M/M
DB25 Gender Changer, F/F
DB25 to DB9 Adapter
Plastic Parts Boxes, 2
Stubby Reversible Screwdriver
Cable Tie Assortment, 100 pcs.
RJ11 Patch Cable and Coupler
RJ45 Patch Cable and Coupler
Modem/Telephone Tester
Deluxe Attaché Tool Case





SPC-79R and RD

Roto-Classic Case Models

Very attractive Roto-Classic styles are the most popular models in the SPC-79 Series Field Service Tool Kits. The SPC-79R is supplied in our black #334 Roto-Classic polyethylene case that measures 17.8" x 12.75" x 5.75" (inside dimensions) and weighs 22 pounds. Our SPC-79RD comes in the deep version #336 Roto-Classic case that measures 18" x 12.65" x 8.5" (inside dimensions) and weighs

23 pounds. Either two-pallet case may be ordered separately. An optional Fluke 77 DMM is also available.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 77	Tool Case Only
SPC-79R	1	\$659.00 ea.	\$838.00 ea.	082X334
5" Roto-Classic	2-5	624.00 ea.	799.00 ea.	1-5 \$165.00 ea.
Case Model	6-11	594.00 ea.	764.00 ea.	6-24 150.00 ea.
SPC-79RD	1	\$669.00 ea.	\$848.00 ea.	082X336
8" Roto-Classic	2-5	634.00 ea.	809.00 ea.	1-5 \$175.00 ea.
Case Model	6-11	604.00 ea.	774.00 ea.	6-24 160.00 ea.



SPC-79WD and WX

Heavy-Duty Roto-Rugged Case Models

These are our heaviest duty options in this series. The SPC-79WD is supplied in our black #460 Roto-Rugged case that measures 17.5" x 14" x 6.5" (inside dimensions) and weighs 23 pounds. Our SPC-79WX comes in the deep version #462 Roto-Rugged case that measures 17.5" x 14" x 10" (inside dimensions) and weighs 24 pounds. These sturdy cases are built to take abuse. Both tool cases feature beefed-up construction, steel (spring-loaded) handles and quarter-turn latches. Either two-pallet case may be ordered separately. An optional Fluke 77 DMM is also available.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 77	Tool Case Only
SPC-79WD	1	\$669.00 ea.	\$848.00 ea.	082X460
6" Roto-Rugged	2-5	634.00 ea.	809.00 ea.	1-5 \$175.00 ea.
Case Model	6-11	604.00 ea.	774.00 ea.	6-24 160.00 ea.
SPC-79WX	1	\$679.00 ea.	\$858.00 ea.	082X462
10" Roto-Rugged	2-5	644.00 ea.	819.00 ea.	1-5 \$180.00 ea.
Case Model	6-11	614.00 ea.	784.00 ea.	6-24 165.00 ea.



SPC-79AL and AX

Prestige Aluminum Case Models

Brushed aluminum finish and extreme lightweight construction are what make these tool kits special. The SPC-79AL is supplied in our #079 aluminum tool case that measures 17.5" x 12.75" x 6" (inside dimensions) and weighs just 19 pounds. Model SPC-79AX comes in our #179 deep aluminum case measuring 17.5" x 12.75" x 8" (inside dimensions) and weighing 20 pounds. Either of these beautiful two-pallet cases may be ordered separately without tools. An optional Fluke 77 DMM is also available.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-79AL	1	\$737.00 ea.	\$916.00 ea.	082X079
6" Aluminum	2-5	699.00 ea.	874.00 ea.	1-5 \$244.00 ea.
Case Model	6-11	664.00 ea.	834.00 ea.	6-24 224.00 ea.
SPC-79AX	1	\$779.00 ea.	\$958.00 ea.	082X179
8" Aluminum	2-5	739.00 ea.	914.00 ea.	1-5 \$295.00 ea.
Case Model	6-11	699.00 ea.	869.00 ea.	6-24 270.00 ea.





SPC-79SHD and SHX

Super Heavy-Duty Polyethylene Case Models

The SPC-79SHD Field Service Tool Kit is supplied in our standard size #456 super durable polyethylene tool case. It measures 17.25" x 13.75" x 7" (inside dimensions) and weighs just over 22 pounds. Model SPC-79SHX Tool Kit comes in our #459 deep polyethylene case that measures 17.25" x 13.75" x 8.5" (inside dimensions) and weighs 23 pounds. Either of these heavy-duty polyethylene cases may be ordered separately without tools. A Fluke 77 DMM is also available as an option.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 77	Tool Case Only
SPC-79SHD	1	\$620.00 ea.	\$799.00 ea.	082X456
7.5" Poly	2-5	589.00 ea.	764.00 ea.	1-5 \$125.00 ea.
Case Model	6-11	559.00 ea.	729.00 ea.	6-24 113.00 ea.
SPC-79SHX	1	\$630.00 ea.	\$809.00 ea.	082X459
8.5" Poly	2-5	599.00 ea.	774.00 ea.	1-5 \$135.00 ea.
Case Model	6-11	569.00 ea.	739.00 ea.	6-24 121.00 ea.



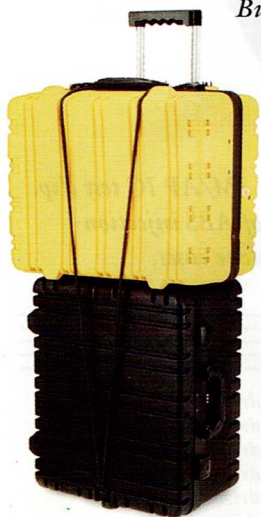
SPC-79C

Built-In Luggage Case Model

Model SPC-79C is supplied in our #526 luggage cart case. This is a very special version of our heavy-duty polyethylene case that features an integral luggage cart. Low profile rubber wheels are permanently mounted to the side edge of the case for smooth rolling, and their small size makes them almost unnoticeable.

The handle is recessed into the other side so that it is flush with the edge of the case when collapsed. We've even added a couple of small metal rails to the underside of the case to protect it from stair or curb damage. Finally all the guts of the cart are cleverly hidden under a removable plastic tray in the extreme bottom of the case.

Our SPC-79C measures 17.25" x 14" x 10" (inside dimensions) and weighs 29 pounds. The #526 case may be ordered separately without tools. A Fluke 77 is also available as an option.



Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 77	Tool Case Only
SPC-79C	1	\$777.00 ea.	\$956.00 ea.	082X526
Luggage Cart	2-5	738.00 ea.	913.00 ea.	1-5 \$285.00 ea.
Case Model	6-11	699.00 ea.	869.00 ea.	6-24 265.00 ea.



SPC-47 Series

Basic Field Service Tool Kits

The SPC-47 Series Tool Kits were developed in response to demands from you, our customer. You told us you wanted a traditional set of basic hand tools to service a wide variety of electronic equipment with a choice of case styles and sizes. We listened, and the result is our SPC-47 Series Kits.

Each of these tool kits consists of a carefully selected complement of basic electronic-type hand tools packaged in a choice of five different case designs. This particular set of tools is unlike most of our others. It features all fixed-handle fastening tools (screwdrivers and nutdrivers) for customers who prefer the traditional style of tool over the blade type commonly used in most kits today.

Most standard and necessary tools are included with each SPC-47. They include small and medium-sized pliers and cutters, a complete set of small combination wrenches, vise grip pliers, a pair of electrician's-type scissors, a grounded soldering iron, crimp tool, adjustable wrench and wire stripper — to name just some. We've also added many specialty tools that you said you wanted. You get a Bondhus balldriver hex set, an

Edsyn conductive desoldering tool and the 3M/AP IC test clip.

The SPC-47 Series comes in three sizes of ABS injection-molded-type cases and two sizes of polyethylene cases.



TOOLS

IC Test Clip, 14/16 pin
Ball Allen Hex Set, English
Combination Wrench, $\frac{3}{8}$ "
Combination Wrench, $\frac{7}{16}$ "
Combination Wrench, $\frac{1}{2}$ "
Combination Wrench, $\frac{9}{16}$ "
Combination Wrench, $\frac{5}{8}$ "
Desoldering Tool
Slot Screwdriver
Phillips Screwdriver
Combination Spring Hook Tool

Wire Stripper, Adjustable
Small Vise Grip, 5"
Electrician's Scissor
Hemostat, Straight 6"
Adjustable Wrench, 6"
Midget Chain Nose Plier
Diagonal Cutting Plier, 5"
Flush Cutting Plier, 4"
Utility Plier, 6 $\frac{1}{2}$ "
Long Nose Plier w/ Cutter
Combination Crimper/Cutter

Soldering Iron, 25-Watt
Precision Knife
Nutdriver, $\frac{3}{16}$ "
Nutdriver, $\frac{7}{32}$ "
Nutdriver, $\frac{1}{4}$ "
Nutdriver, $\frac{9}{32}$ "
Nutdriver, $\frac{5}{16}$ "
Nutdriver, $\frac{11}{32}$ "
Nutdriver, $\frac{3}{8}$ "
Nutdriver, $\frac{7}{16}$ "
Nutdriver, $\frac{1}{2}$ "

Slot Screwdriver, $\frac{1}{2}$ ", 4"
Slot Screwdriver, $\frac{1}{8}$ ", 2"
Slot Screwdriver, $\frac{3}{16}$ " x 3"
Slot Screwdriver, $\frac{3}{32}$ " x 2"
Slot Screwdriver, $\frac{5}{16}$ " x 6"
Slot Screwdriver, Stubby
Phillips Screwdriver, Stubby
Phillips Screwdriver, #0 pt.
Phillips Screwdriver, #1 pt.
Phillips Screwdriver, #2 pt.
Deluxe Attaché Tool Case





SPC-47 and 47D

Injection Molded Case Models

The SPC-47 is supplied in our #244 deluxe 4" injection molded tool case that measures 17.5" x 12.75" x 4.5" (inside dimensions) and weighs 18 pounds. Our SPC-47D comes in our #246 deep injection molded tool case that measures 18" x 13" x 5" (inside dimensions) and weighs 19 pounds. These classic injection molded style cases are favored for their compact sleek lines and relative light weight. Brown, two-pallet tool cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-47	1	\$355.00 ea.	\$534.00 ea.	082X244
<i>4" Inj. Molded Case Model</i>	2-5	337.00 ea.	512.00 ea.	1-5 \$120.00 ea.
	6-11	320.00 ea.	490.00 ea.	6-24 108.00 ea.
SPC-47D	1	\$365.00 ea.	\$544.00 ea.	082X246
<i>5.5" Inj. Molded Case Model</i>	2-5	347.00 ea.	522.00 ea.	1-5 \$130.00 ea.
	6-11	330.00 ea.	500.00 ea.	6-24 117.00 ea.



SPC-47HD and 47HX

Standard Polyethylene Case Models

Model SPC-47HD is supplied in our #444 standard depth polyethylene tool case that measures 18.25" x 13" x 7" (inside dimensions) and weighs 19 pounds. Our SPC-47HX comes in our #447 deep polyethylene tool case that measures 18" x 13" x 7.5" (inside dimensions) and weighs 20 pounds. Very popular kits for engineers on the move. These poly cases are very durable and sized to accommodate a wide variety of tools. Black, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-47HD	1	\$340.00 ea.	\$519.00 ea.	082X444
<i>7" Polyethylene Case Model</i>	2-5	323.00 ea.	498.00 ea.	1-5 \$125.00 ea.
	6-11	307.00 ea.	477.00 ea.	6-24 113.00 ea.
SPC-47HX	1	\$350.00 ea.	\$529.00 ea.	082X447
<i>7.5" Polyethylene Case Model</i>	2-5	333.00 ea.	508.00 ea.	1-5 \$135.00 ea.
	6-11	317.00 ea.	487.00 ea.	6-24 122.00 ea.



SPC-47WD and 47WX

Durable Roto-Rugged Case Models

The SPC-47WD is supplied in our #470 Roto-Rugged polyethylene tool case that measures 17.5" x 14" x 6.5" (inside dimensions) and weighs 20 pounds. Our SPC-88WX comes in our #472 Roto-Rugged polyethylene tool case that measures 17.5" x 14" x 10" (inside dimensions) and weighs 22 pounds. Our Roto-Rugged cases are built to take abuse. Military-type hardware, extra large corners and beefier construction allow these cases to be shipped without problem. Black, two-pallet cases also may be purchased separately. Either kit is available with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-47WD	1	\$395.00 ea.	\$574.00 ea.	082X470
<i>6" Roto-Rugged Case Model</i>	2-5	375.00 ea.	550.00 ea.	1-5 \$155.00 ea.
	6-11	355.00 ea.	525.00 ea.	6-24 140.00 ea.
SPC-47WX	1	\$405.00 ea.	\$584.00 ea.	082X472
<i>10" Roto-Rugged Case Model</i>	2-5	385.00 ea.	560.00 ea.	1-5 \$165.00 ea.
	6-11	365.00 ea.	535.00 ea.	6-24 149.00 ea.



SPC-99 Series Professional FE Tool Kits

Introducing our newest family of tool kits. The SPC-99 Series Professional FE Tool Kits were designed primarily for self-maintainers charged with a variety of service tasks. These are very comprehensive FE kits that were developed from the feedback we received from dozens of our customers. You told us you wanted a kit for your in-house service requirements that not only provided all the essential tools but delivered exceptional value at the same time.

Our new SPC-99 Professional FE Kits include everything necessary to handle the most demanding jobs. They offer a full selection of standard tools such as screwdrivers, nutdrivers, pliers and cutters, hemostats, vise grip pliers and a heavy-duty soldering iron. We've also included a deluxe aluminum flashlight, an anti-static wrist strap, receptacle analyzer, plastic oiler, telephone line tester and an ac sensor — to name just a few. See TOOLS listing below for a complete list.



And we offer these economical kits in three of our most popular styles of cases. These include our very attractive Roto-Classic polyethylene cases that have quickly become our most asked for models plus the new Roto-Rugged cases that are both slightly oversized (up to 10" deep!) and really built to take abuse. Finally, the Prestige brushed aluminum cases have always been a favorite in the high-tech environment, and they are sure to make an impression.

TOOLS

Soldering Aid
Inspection Mirror
Metal Rule, 6"
Electrician's Scissors
Slip Joint Plier, 6"
Reverse Action Tweezer
Alignment Tools, 2
Thickness Gauge
Offset Ratchet Screwdriver
Soldering Iron, 25-Watt
Diagonal Cutting Pliers, 4" and 5"
Utility Plier, 10"

Regular Handle, Straight
9 Nutdriver Blades, $\frac{3}{16}$ " - $\frac{1}{2}$ "
Slot Screwdriver, $\frac{1}{4}$ " x 4"
Slot Screwdriver, $\frac{1}{8}$ " x 2"
Slot Screwdriver, $\frac{1}{8}$ " x 8"
Slot Screwdriver, $\frac{3}{16}$ " x 3"
Slot Screwdriver, $\frac{3}{32}$ " x 2"
Slot Screwdriver, $\frac{5}{16}$ " x 6"
Slot Screwdriver, Stubby
Pocket Phillips Screwdriver
Phillips Screwdriver, #0 Pt.
Phillips Screwdriver, #1 Pt.

Phillips Screwdriver, #2 Pt.
Side Cutting Plier, 6"
Screwholding Screwdriver
Solder Pocket Pak
Electrician's Knife
Tenite Parts Box
Pocket Burnishing Tool
Combination Spring Hook Tool
Vise Grip Plier
Straight Hemostat
Needle Files, 3
Precision Knife

Chain Nose Plier, 4 $\frac{1}{2}$ "
Wire Stripper
Aluminum Flashlight
AA Batteries, 2 ea.
Conductive Wrist Strap
Receptacle Analyzer with Ground
Hex Wrench Set, $\frac{5}{64}$ " - $\frac{3}{16}$ "
2-ounce Plastic Oiler
Desoldering Braid
AC Sensor
Attaché Tool Case



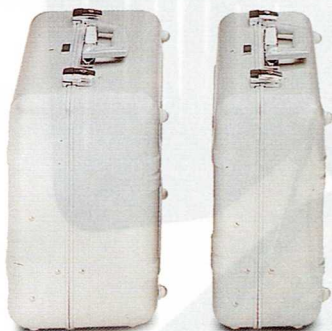


SPC-99R and 99RD

Our Popular Roto-Classic Case Models

These very attractive kits are the most popular models in this new series. The SPC-99R is supplied in our black 364 Roto-Classic polyethylene case that measures 17.5" x 12.75" x 5" (inside dimensions) and weighs about 21 pounds. Our SPC-99RD comes in the deeper version 366 case that measures 17.75" x 12.75" x 8.75" (inside dimensions) and weighs 22 pounds. Either two-pallet case may be ordered separately. An optional Fluke 77 DMM is also available.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-99R	1	\$480.00 ea.	\$659.00 ea.	082X364
5" Roto-Classic	2-5	456.00 ea.	631.00 ea.	1-5 \$165.00 ea.
Case Model	6-11	433.00 ea.	603.00 ea.	6-24 150.00 ea.
SPC-99RD	1	\$490.00 ea.	\$669.00 ea.	082X366
8" Roto-Classic	2-5	466.00 ea.	641.00 ea.	1-5 \$175.00 ea.
Case Model	6-11	443.00 ea.	613.00 ea.	6-24 160.00 ea.



SPC-99AL and 99AX

Prestige Aluminum Case Models

Brushed aluminum finish and extreme lightweight construction are what make these kits special. The SPC-99AL utilizes our 076 aluminum tool case that measures 17.5" x 12.75" x 6" (inside dimensions) and weighs 19 pounds. Model SPC-99AX comes in our 176 aluminum case measuring 17.5" x 12.75" x 8" (inside dimensions) and also weighs 19 pounds. Cases may be ordered separately without tools. A Fluke 77 DMM is available as an option.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-99AL	1	\$570.00 ea.	\$749.00 ea.	082X076
6" Aluminum	2-5	541.00 ea.	716.00 ea.	1-5 \$244.00 ea.
Case Model	6-11	514.00 ea.	684.00 ea.	6-24 224.00 ea.
SPC-99AX	1	\$610.00 ea.	\$789.00 ea.	082X176
8" Aluminum	2-5	579.00 ea.	754.00 ea.	1-5 \$295.00 ea.
Case Model	6-11	550.00 ea.	720.00 ea.	6-24 270.00 ea.



SPC-99WD and 99WX

Heavy-Duty Roto-Rugged Case Models

Our heavy-duty entry in this series. The SPC-99WD is supplied in the black 420 Roto-Rugged case that measures 18.875" x 15.5" x 6.25" (inside dimensions) and weighs in at 22 pounds. Model SPC-99WX comes in our black 422 Roto-Rugged case measuring 18" x 15.5" x 10" (inside dimensions) and weighing just under 23 pounds. Both cases feature beefed-up construction, steel (spring-loaded) handles and quarter-turn latches. Cases may be ordered separately. An optional Fluke 77 DMM is also available.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-99WD	1	\$495.00 ea.	\$674.00 ea.	082X420
6" Roto-Rugged	2-5	469.00 ea.	644.00 ea.	1-5 \$155.00 ea.
Case Model	6-11	446.00 ea.	616.00 ea.	6-24 140.00 ea.
SPC-99WX	1	\$505.00 ea.	\$684.00 ea.	082X422
10" Roto-Rugged	2-5	479.00 ea.	654.00 ea.	1-5 \$165.00 ea.
Case Model	6-11	456.00 ea.	626.00 ea.	6-24 149.00 ea.





SPC-81 Series

Electro-Mechanical Attaché Tool Kits

Our SPC-81 family of tool kits was designed to offer a more mechanical variety of tools than our traditional field service kits. Ideally suited for plant maintenance, vehicle repairs, hardware installations and particularly remote site service operations, these kits contain everything necessary to perform a wide variety of tasks. You get small electronic-type service tools all the way up to 10"-12" mechanics tools.

The selection of more than 150 tools in each SPC-81 includes a complete range of screwdrivers, nutdrivers plus eight pliers and cutters. But that's just the basics. We also include a complete set of combination wrenches ($\frac{3}{8}$ "-1"), a deluxe $\frac{3}{8}$ "-drive socket set, heavy-duty cable cutter, a complete set of insulated terminals and connectors (with crimp tool) and a high-output, temperature-controlled Weller® soldering iron. Plus a heavy-duty extension cord, an extension cord, an assortment of cable ties, an ac receptacle analyzer (GFI), deluxe hack saw and 50 other items too numerous to mention.

All of these tools are carefully arranged on four pallet surfaces (three-pallet wing-type pallet in top and standard pallet in bottom). We offer the SPC-81 Series Tool Kits in our choice of five different rugged tool cases. Choose from our black (SHX) or yellow (Y) super heavy-duty polyethylene cases, the black (MLB) or olive-green (MLG) military-style cases or the very popular luggage cart (C) case.



TOOLS

Utility Pliers, 8"
Utility Pliers, 12"
Slip Joint Pliers, 6"
Deluxe Desoldering Tool
T-Handle Mechanics Reamer
Deluxe Thickness Gauge, 26 sizes
Lineman's Side Cutting Pliers, 9"
Heavy-Duty Diagonal Cutting Pliers, 5"
Long Nose Pliers w/ Cutter, 6"
High-Leverage Diagonal Pliers, 8"
Metal Hacksaw, 10" (with blades)
High-Leverage Cable Cutter

Insulated Terminals and Connectors (125 pcs.)
Adjustable Wrench, 6"
Adjustable Wrench, 10"
English/Metric Tape Measure, 16'
Retractable Utility Knife
Ball Pein Hammer, 12-oz.
Deluxe Oval Inspection Mirror
Magnetic Pick-up Tool
Temperature-Controlled Soldering Iron, 60-Watt
Large Precision Knife
Nutdrivers, 9 ($\frac{3}{16}$ " - $\frac{9}{16}$ ")

Slot Screwdriver, $\frac{1}{4}$ "
Slot Screwdriver, $\frac{1}{8}$ "
Slot Screwdriver, $\frac{3}{8}$ "
Slot Screwdriver, $\frac{3}{16}$ "
Slot Screwdriver, $\frac{5}{16}$ "
Phillips Screwdriver, #0 pt.
Phillips Screwdriver, #1 pt.
Phillips Screwdriver, #2 pt.
Phillips Screwdriver, #3 pt.
Balldriver Hex Set, 13 pcs.
Safety Approved Flashlight
Electrical Tape, 1 roll
Instrument Oiler, 4 oz.

Standard Vise Grip Pliers, 7"
Combination Wrenches, 10 pcs. ($\frac{3}{8}$ " - 1")
 $\frac{3}{8}$ "-Drive Socket Set
All-Weather Extension Cord, 10'
Wire Stripper, 8-16 AWG
Wire Stripper, 16-26 AWG
GFI Receptacle Analyzer
Multi-Purpose Crimp Tool
Cable Tie Assortment, 100 pcs.
Ruggedized Tool Case with Wing Pallets





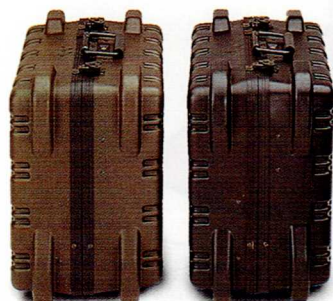
Optional
38091F
Digital
Amp Clamp
Meter offered
with each case

SPC-81SHX and Y

Super Heavy-Duty Polyethylene Case Models

Model SPC-81SHX is supplied in our black #449 deep polyethylene tool case that measures 17.5" x 14.25" x 8.5" (inside dimensions) and weighs just over 40 pounds. The SPC-81Y comes in our #448 high-visibility yellow polyethylene case with the same dimensions and weight. Both cases include our unique wing pallet design in the top of the case and a standard tool pallet in the bottom. Available with an optional Exttech 38091F Digital Amp Clamp Meter.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 38091F	Tool Case Only
SPC-81SHX	1	\$799.00 ea.	\$968.00 ea.	082X449
<i>Black</i>	2-5	759.00 ea.	924.00 ea.	1-5 \$165.00 ea.
<i>Case Model</i>	6-11	720.00 ea.	881.00 ea.	6-24 150.00 ea.
SPC-81Y	1	\$840.00 ea.	\$1009.00 ea.	082X448
<i>Yellow</i>	2-5	798.00 ea.	963.00 ea.	1-5 \$199.00 ea.
<i>Case Model</i>	6-11	756.00 ea.	917.00 ea.	6-24 182.00 ea.



SPC-81MLG and MLB

HD Military-Style Case Models

The SPC-81MLG is supplied in our #562 olive-green Mil-Style polyethylene tool case that measures 17.5" x 13.75" x 9.5" (inside dimensions) and weighs just over 40 pounds. Our SPC-81MLB comes in our black #564 Mil-Style polyethylene tool case that measures 17.5" x 13.75" x 9.5" (inside dimensions) and weighs just over 40 pounds. Each case is designed with a wing pallet in the top of the case and a standard pallet in the bottom. Available with an optional Exttech 38091F Digital Amp Clamp Meter.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 38091F	Tool Case Only
SPC-81MLG	1	\$840.00 ea.	\$1009.00 ea.	082X562
<i>Olive-Green</i>	2-5	798.00 ea.	963.00 ea.	1-5 \$199.00 ea.
<i>Case Model</i>	6-11	756.00 ea.	917.00 ea.	6-24 182.00 ea.
SPC-81MLB	1	\$840.00 ea.	\$1009.00 ea.	082X564
<i>Black</i>	2-5	798.00 ea.	963.00 ea.	1-5 \$199.00 ea.
<i>Case Model</i>	6-11	756.00 ea.	917.00 ea.	6-24 182.00 ea.

SPC-81C

Built-In Luggage Case Model

Model SPC-81C is supplied in our #520 luggage cart case. This is a very special version of our heavy-duty polyethylene case that features an integral luggage cart. Low profile rubber wheels are mounted to the side edge of the case for smooth rolling, and their small size makes them almost unnoticeable. The handle is recessed into the other side so that it is flush with the edge of the case when collapsed. We've even added a couple of small metal rails to the underside of the case to protect it from stair or curb damage. Finally, all the guts of the cart are cleverly hidden under a removable plastic tray in the extreme bottom of the case.

Our SPC-81C measures 17.5" x 14.25" x 8.5" (inside dimensions) and weighs 48 pounds. The #520 case may be ordered separately, and the kit is available with or without the Exttech 38091F Digital Amp Clamp Meter.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 38091F	Tool Case Only
SPC-81C	1	\$952.00 ea.	\$1121.00 ea.	082X520
<i>Luggage Cart</i>	2-5	904.00 ea.	1069.00 ea.	1-5 \$325.00 ea.
<i>Case Model</i>	6-11	859.00 ea.	1020.00 ea.	6-24 289.00 ea.





SPC-29

Customer Field Support Kit

Our new SPC-29 Tool Kits are designed for computer and office equipment repair technicians and field service personnel who are constantly on the go. A group of our major customers specified their self-maintenance requirements. They took the best of our existing kits and added useful products for static control and connector compatibility along with several newly developed tools. This exclusive combination makes the SPC-29 one of the most comprehensive kits we've ever offered.

It includes standard repair tools like screwdrivers, nutdrivers, a crimping tool, soldering/desoldering equipment, pliers/cutters, etc. By request, we've added Torx® drivers, RS-232 gender changers, a Mag Lite® flashlight, a complete static-control kit with mat, wrist strap and ground cord, CRT cleaning wipes, an aerosol duster and a flux removal pen.

Choose from two sizes of attractive black Roto-Classic tool cases. These virtually indestructible cases can be checked as airline baggage to meet field service engineers' demanding schedules. The 20-pound SPC-29 measures 18" x 12.75" x 5.5" (inside dimensions). Our 21-pound extra-deep SPC-29D is the same basic size but a full 8.5 inches deep. Tools come with life-time warranties; cases have one-year warranties. Each kit is available with an optional Fluke 87 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 87
SPC-29	1	\$509.00 ea.	\$844.00 ea.
Standard 5"	2-5	483.00 ea.	808.00 ea.
CFS Kit	6-11	459.00 ea.	777.00 ea.
SPC-29D	1	\$519.00 ea.	\$854.00 ea.
Deep 8"	2-5	493.00 ea.	818.00 ea.
CFS Kit	6-11	468.00 ea.	786.00 ea.

Tool Cases Only (No Tools)

082X320	320 Case — 5" Deep.....	1-5, \$165.00 ea.; 6-24, \$150.00 ea.
082X322	322 Case — 8" Deep.....	1-5, 175.00 ea.; 6-24, 160.00 ea.

TOOLS

Inspection Mirror
Machinist Scale, 6"
Slip Joint Plier, 6"
Chain Nose Plier, 4"
Long Nose Plier/Cutter, 6"
Diagonal Cutting Plier, 4"
Diagonal Cutting Plier, 5"
Combination Spring Hook
Burnishing Tools, 3
Pocket Pak Solder
Electrician's Scissors
Hemostat (Straight), 6"
Adjustable Wrench, 6"

Tape Measure, 10'
Ball Pein Hammer, 4-oz.
Screwholding Screwdriver
25-Watt Soldering Iron
Desoldering Braid
Precision Knife
Nutdriver, 3/16"
Nutdriver, 1/4"
Nutdriver, 5/16"
Nutdriver, 3/8"
Pocket Phillips Screwdriver, 0-pt.
Std. Phillips Screwdriver, 0-pt.
Std. Phillips Screwdriver, 1-pt.

Std. Phillips Screwdriver, 2-pt.
Std. Slot Screwdriver, 1/4" x 4"
Std. Slot Screwdriver, 1/8" x 4"
Std. Slot Screwdriver, 3/32" x 3"
Stubby Reversible Screwdriver
Torx Driver, T10
Torx Driver, T15
Torx Driver, T20
Torx Driver, T25
Deluxe Parts Box
Std. Hex Set, 5/64" - 3/16"
Metric Hex Set, 1.5 mm-5 mm
Deluxe Crimp Tool

Trimpot Adjusting Tool
Vise Grip Plier, 5"
CRT Cleaning Systems (5 ea.)
Ultrajet Duster, 5-oz.
Flux Removal Pen
Wire Stripper, 10-18 AWG
Wire Stripper, 22-30 AWG
Receptacle Analyzer w/ Ground
RS-232 M/M Gender Changer
RS-232 F/F Gender Changer
Deluxe 3M Grounding Kit
Mag-Lite Aluminum Flashlight
Black Roto-Classic Tool Case





SPC-185

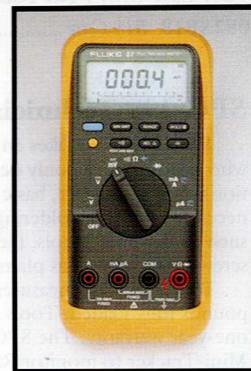
Complete Attaché Zipper Tool Kit

Our new SPC-185 was created to address the special requirements of the specialized electronics service professional who demands only the highest quality tools. Working closely with one of our major customers, we built this kit from the ground up.

First there's our 838 case that's unlike anything we have ever offered before. It's roughly the same size as our standard attaché cases, except this is a lightweight Cordura zipper style! Black in color, it comes complete with a detachable shoulder strap, a full size document pouch plus two large instrument pouches.

The complement of tools is also unique to the new SPC-185 kit. Technicians who work on state-of-the-art medical equipment or sophisticated electronics require the highest quality tools, and our SPC-185 delivers. We've included a special complement of pliers and cutters that features chrome vanadium steel construction with soft foam grips, a temperature-controlled soldering iron, special hardened tip screwdrivers, a genuine Mag-Lite flashlight, 3M conductive wrist strap and much more.

The case measures a full 18" x 13" x 3.5" and weighs 14 pounds fully loaded. Tools come with lifetime warranties; the case has a one-year warranty. Our SPC-185 is available with an optional Fluke 87 DMM.



Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 87
SPC-185	1	\$475.00 ea.	\$810.00 ea.
<i>Attaché Zipper</i>	2-5	450.00 ea.	775.00 ea.
<i>Tool Kit</i>	6-11	428.00 ea.	746.00 ea.

Tool Case Only (No Tools)

082X838 838 Case.....1-5, \$95.00 ea.; 6-24, \$86.00 ea.

TOOLS

Utility Pliers, 8"
Offset Ratchet Screwdriver
Adjustable Wrench, 4"
Adjustable Wrench, 8"
Screwstarter, Slot/Phillips
Temp-Controlled Soldering Iron
Regular Handle
4" Blade Extension
9 Nutdriver Blades, 3/16" - 1/2"

8 Nutdriver Blades, 4-11 mm
2 Slot Screwdriver Blades
2 Phillips Screwdriver Blades
Slot Screwdriver, 1/4" x 4"
Slot Screwdriver, 1/8" x 2"
Slot Screwdriver, 3/16" x 6"
Slot Screwdriver, 5/16" x 6"
Slot Screwdriver, 5/32" x 4"

Phillips Screwdriver, 0-pt.
Phillips Screwdriver, 1-pt.
Phillips Screwdriver, 2-pt.
Conductive Desoldering Tool
Deluxe Hex Wrench Set, .050" - 5/16"
Deluxe Hex Wrench Set, 1.5-10 mm
Crimping Tool
Vise Grip Pliers, 6"

T-Type Wire Stripper
Chain Nose Pliers, 4 1/2"
Long Nose Pliers, 6"
Needle Nose Pliers, 5"
Flush Cutting Pliers, 4"
Diagonal Cutting Pliers, 5"
Mag-Lite Flashlight w/ Batteries
Conductive Wrist Strap, Adjustable
Large Cordura Zipper Case



SPC-309

Workstation Repair Kit

Over the years we've built thousands of special tool kits for people who needed a basic assortment of tools but didn't want a full-blown installation kit. The SPC-309 Workstation Repair Kit meets these needs by featuring the most requested tools. Physically the smallest kit we've ever offered, it contains every essential tool to perform basic repair at the workstation level.

Just some of its tools are a selection of screwdrivers, nutdrivers and hex tools, the two most popular Torx® drivers, professional soldering iron, knife, tie wraps, pliers/cutters and jeweler's screwdriver. But we didn't stop with just the basics. We also made provisions for two RS-232 gender changers to prevent wasted time when connectors are incompatible, the popular Caps-Off tool to pull key caps off of a keyboard for repair or cleaning and even a few Screen Prep Pads for cleaning CRTs and keyboards.

The 082X818 case is made of a tough blue Cordura® material and will fit easily in a desk drawer or briefcase. It comes complete with web-type handles for easy transport and exterior pouches to hold paperwork, manuals, etc. This kit measures only 9.5" x 7.5" x 2.75" and weighs just 3.5 pounds loaded. Tools carry lifetime warranties; the case has a one-year warranty. The SPC-309 also may be purchased with Extech's 381625 Pen-Type DMM that fits nicely in the spine of the case.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 381625
SPC-309	1	\$156.00 ea.	\$205.00 ea.
<i>Workstation</i>	2-5	148.00 ea.	195.00 ea.
<i>Tool Kit</i>	6-11	141.00 ea.	186.00 ea.

Tool Case Only (No Tools)

082X818 818 Case1-5, \$39.00 ea.; 6-24, \$35.00 ea.

SPC-199 Technician's Compact Kit

The SPC-199 makes an ideal kit for the student technician or anyone who needs to make only occasional repairs. This kit is often the perfect solution when a compact, basic set of tools is needed. We've included all the necessary tools for soldering/desoldering and making typical adjustments such as alignment tools, files, burnishers, hex and Spline keys, nutdrivers and screwdrivers as well as pliers and cutters — to name just a few.

This small case measures only 12.5" x 10.5" x 2" and weighs just 6 pounds fully loaded. Tools come with lifetime warranties; the case has a one-year warranty. The SPC-199 may be purchased with an optional MT-31 Mini-Tracker to monitor RS-232 signals.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ MT-31 Mini-Tracker
SPC-199	1	\$162.00 ea.	\$192.00 ea.
<i>Technician's</i>	2-5	153.00 ea.	180.00 ea.
<i>Compact Kit</i>	6-11	146.00 ea.	171.00 ea.

Tool Case Only (No Tools)

082X099 099 Case1-5, \$34.00 ea.; 6-24, \$31.00 ea.



TOOLS

8-pc. Hex Key Set, .050" - 5/32"
Slip Joint Plier, 6"
Long Nose Plier, 4"
Diagonal Cutting Plier, 4"
Jeweler's Screwdriver
60/40 Pocket Pak Solder
Cable Ties, Pkg. of 10
Screwstarter, Slot/Phillips
Professional 20-W Soldering Iron
Precision Knife
Blade Extension, 4"
Standard Blade Handle

Nutdriver Blades, 3/16 - 5/16" (3)
Slot Screwdriver Blade, 1/4"
Phillips Screwdriver Blade, #1-pt.
Torx Blades, #T10/#T15 (2)
Adjustable Wire Stripper
Pocket Flashlight
Key Cap Puller
Alignment Tool, Non-Magnetic
Screen Prep Cleaning Pads (3)
Desoldering Braid, 5' Roll
DB25 Gender Changers (2)
Miniature Cordura® Case



TOOLS

Alignment Tool
Trimpot Adjuster
Contact Burnisher
Flat Needle File
Round Needle File
Regular Handle
Junior Handle
Hex Key Set

Precision Knife
Nutdriver, 1/4"
Nutdriver, 5/16"
Nutdriver, 3/8"
Diagonal Pliers, 4"
Chain Nose Pliers, 4 1/2"
Long Nose Pliers, 6"
Steel Rule, 6"

Slot Screwdriver, 3/16"
Slot Screwdriver, 1/4"
Slot Screwdriver, 5/16"
Phillips Screwdriver, #0
Phillips Screwdriver, #1
Phillips Screwdriver, #2
Soldering Iron, 25-Watt
Soldering Aid

Desolder Wick
Rosin Solder, 60/40
Reverse Action Tweezer
Wire Stripper
Adjustable Wrench, 4"
Utility Plier, 6"
Pocket Scribe
Padded Zipper Case



SPC-300

Computer Site Manager's Tool Kit

The SPC-300 was designed for basic troubleshooting of computer installations. It is primarily a non-technical kit that can be utilized by whoever in your organization is responsible for your computer site. All the necessary tools and equipment are included to attach cables, connect peripherals and install rack-mounted equipment such as modems/multiplexers, etc.

Basic tools include hex wrenches, pliers/cutters, small hammer, screw-starters, wire strippers, nutdrivers, screwdrivers, scissors and more. We've also included other really useful equipment such as male-to-male and female-to-female gendermates, a 50-LED MT-2 Mini-Tracker for easy checking of RS-232 signals, a micropatch temporary RS-232 interface, a 4-foot double ended ribbon cable for making quick connections and even some tie wraps for keeping your cable neat and orderly plus many more.

The SPC-300 Site Manager's Kit is packaged in our very attractive, high-tech gray 866 Cordura tool case. The 8-pound kit is a roomy 16" x 11" x 3" and features three exterior pockets for holding additional parts and documentation. Two are 8" x 5" x 2", and one is 10" x 9" x 2". Tools carry lifetime warranties; the case has a one-year warranty.

Model No.	Description	Qty.	Tool Kit
SPC-300	Computer Site	1	\$311.00 ea.
	Manager's Kit	2-5	295.00 ea.
		6-11	280.00 ea.

Tool Case Only (No Tools)

082X866 866 Gray Cordura Case.....1-5, \$60.00 ea.; 6-24, \$54.00 ea.



TOOLS

Pocket Slot Screwdriver
Diagonal Cutting Plier, 5"
Long Nose Plier w/ Cutter, 5"
Precision Knife
Regular Handle
Blade Extension, 4"
Nutdriver Blade, 3/16"
Nutdriver Blade, 1/4"
Nutdriver Blade, 5/16"

Slot Screwdriver Blade, 1/8"
Slot Screwdriver Blade, 3/16"
Slot Screwdriver Blade, 1/4"
Phillips Screwdriver Blade, #0 Pt.
Phillips Screwdriver Blade, #1 Pt.
Phillips Screwdriver Blade, #2 Pt.
Magnetic Pick-up Tool
Pkg. of Cable Ties
Adjustable Wrench, 6"

Electrician's Scissor
Disposable Penlight
Vise Grip Plier, 6"
Tape Measure, 8'
Receptacle Analyzer
Wire Stripper, 16-26 AWG
Slot Screwdriver
Phillips Screwstarter
Small Ball Pein Hammer

Slip Joint Plier, 6"
Ball Hex Driver Set
Double Connector Cable, 4'
MT-2 Mini-Tracker, 50-LED
Micropatch, RS-232 Interface
Male-to-Male Gendermate
Female-to-Female Gendermate
Deluxe Gray Cordura Case

SPC-111 Compact Service Kit

Our most compact kit is the perfect occasional tool set. Small enough to fit in a briefcase or suitcase, it is a favorite of anyone who needs the basics but not a full-sized tool kit. You get a surprisingly wide assortment of tools for such a small kit. You get a soldering iron, adjustable wrench, slot and Phillips screwdrivers, wire stripper, pliers/cutters and more.

The 4-pound kit comes in our 831 zipper case which is 11.5" x 8.5" x 2.5". Tools carry lifetime warranties; the case has a one-year warranty. Available with an optional Extech 381625 probe-type DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 381625
SPC-111	1	\$120.00 ea.	\$169.00 ea.
Compact	2-5	114.00 ea.	161.00 ea.
Service Kit	6-11	109.00 ea.	154.00 ea.

Tool Case Only (No Tools)

082X831 831 Compact Zipper Case.....1-5, \$30.00 ea.; 6-24, \$26.00 ea.

TOOLS

3 Screwdriver Blade, Phillips
2 Screwdriver Blades, Slot
Miniature Screwdriver, Phillips
Miniature Screwdriver, Slot
Blade Handle
Precision Knife
Soldering Iron, 25-Watt
Adjustable Wrench, 4"
Electrician's Scissor
Rosin Solder, 60/40

Adjustable Wire Stripper
Alignment Tool
Diagonal Cutting Plier
Chain Nose Plier
Desoldering Braid
Machinist Scale, 6"
Solder Aid Tool
Hex Key Set, .028" - 3/32"
Padded Zipper Case



All the basic service tools are included. You will find a very complete set of screwdriver and nut-driver blades, a set of small open-end wrenches, small pliers and diagonal cutters, wire stripper, retaining ring pliers, a heavy-duty soldering iron, adjustable wrenches and desolder tool. We've also added a spring hook tool, fuse puller, hex and spline wrenches and even a telephone wiring tester.

We offer our SPC-250 Series Kits in three case styles. Our standard case size is available in our economical vinyl material that includes individual pockets for all of the tools, an interior pouch for carrying small parts and a full-sized DMM pocket. The extra-durable Cordura® version of our standard size case includes all of that plus three roomy exterior pouches for carrying additional equipment or manuals.

The SPC-250X version is supplied in our special double-sided case that features a tool side to accommodate all the tools

SPC-250

Customer Service Kits

Originally designed by a major computer OEM as a computer terminal and printer support kit, our SPC-250 Series kits have become far and away our most popular zipper-type tool kits. Tens of thousands of these kits are currently being used throughout the industry. And not just for computer maintenance as their universal complement of tools is ideal for almost any type of electronic equipment.

and DMM on one side plus a second side that offers a full-sized clipboard and document folio for carrying more documentation or supplies to the jobsite.

Our new 3X triple-sided case is furnished with our SPC-250T kits. It is made of the same tough Cordura® material and construction as our double-sided case, but we've added a large compartment in the center of the case. This center compartment allows for an incredible amount of equipment — even a change of clothes — to be carried in a zipper-type tool case!

TOOLS

3 Screwdriver Blades, Slot
3 Screwdriver Blades, Phillips
Miniature Screwdriver, Slot
Miniature Screwdriver, Phillips
Regular Handle
7" Extension
Screwholding Screwdriver

Desolder Bulb
Hex Key Set, .050" - 3/8"
Spline Key Set
5 Ignition Wrenches, 7/32" - 7/16"
Junior Handle
25-Watt Soldering Iron
9 Nutdriver Blades, 3/16 - 1/2"

Offset Screwdriver, Slot
Offset Screwdriver, Phillips
Jeweler's Screwdriver
Fuse Puller, Small
6" Scale
6" Adjustable Wrench
5" Diagonal Cutter

Int./Ext. Pliers
6" Slip Joint Pliers
6" Long Nose w/ Side Cutter
Wire Stripper, 16-26 Gauge
60/40 Rosin Solder
Telephone Line Tester
Spring Hook Tool
Padded Zipper Case





SPC-250 and 250C

Standard CSR Repair Kits

Our original SPC-250 is supplied in our black 822 vinyl zipper-type tool case. It measures 15" x 10.5" x 2.5" and weighs just 8 pounds fully loaded. The SPC-250C kit is supplied in the virtually indestructible black 828 Cordura® case. Our 828 case is also 15" x 10.5" x 2.5" and weighs 8 pounds complete. The cases are also available separately. Order either kit with an optional Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-250 Std.	1	\$229.00 ea.	\$408.00 ea.	082X822
<i>Std. Vinyl</i>	2-5	218.00 ea.	393.00 ea.	1-5 \$42.00 ea.
<i>Case Model</i>	6-11	207.00 ea.	377.00 ea.	6-24 38.00 ea.
SPC-250C	1	\$245.00 ea.	\$424.00 ea.	082X828
<i>Cordura® Case</i>	2-5	233.00 ea.	408.00 ea.	1-5 \$60.00 ea.
<i>Model</i>	6-11	220.00 ea.	390.00 ea.	6-24 54.00 ea.



SPC-250X

Double-Sided CSR Tool Kit

The SPC-250X is supplied in our special two-sided zipper case (875). On one side you'll find our full complement of tools and equipment, but we've added a new second side. It features a full 9" x 12" document folio pouch, a low profile clipboard, business card pocket and various smaller pockets. This 11-pound kit measures 18" x 11" x 5" and features large exterior pouches for carrying additional tools, test equipment or documentation. The empty 875 may be ordered separately. Order with an optional Fluke 77 DMM.



Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-250X	1	\$289.00 ea.	\$468.00 ea.	082X875
<i>2-Sided Cordura®</i>	2-5	275.00 ea.	450.00 ea.	1-5 \$99.00 ea.
<i>Case Model</i>	6-11	260.00 ea.	430.00 ea.	6-24 89.00 ea.



SPC-250T

New 3X, Triple-Sided CSR Kit

Our new SPC-250T is supplied in our exclusive 3X or triple-sided case. This amazing new zipper kit features the standard two zippered sides (tool side and clipboard/document side) as featured with our 875 case, but we've added a huge center compartment. This new center compartment is large enough to carry a full briefcase full of paperwork or equipment — all in a soft-sided zipper case. The 879 three-sided case measures 18.5" x 12.5" x 8" and weighs about 10 pounds fully loaded. Case may be ordered separately. Optional Fluke 77 DMM is also available.



Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 DMM	Tool Case Only
SPC-250T	1	\$305.00 ea.	\$484.00 ea.	082X879
<i>3-Sided Cordura®</i>	2-5	289.00 ea.	464.00 ea.	1-5 \$125.00 ea.
<i>Case Model</i>	6-11	275.00 ea.	445.00 ea.	6-24 112.00 ea.

For complete tool case specifications, please refer to the Tool Case section of this catalog.





SPC-290

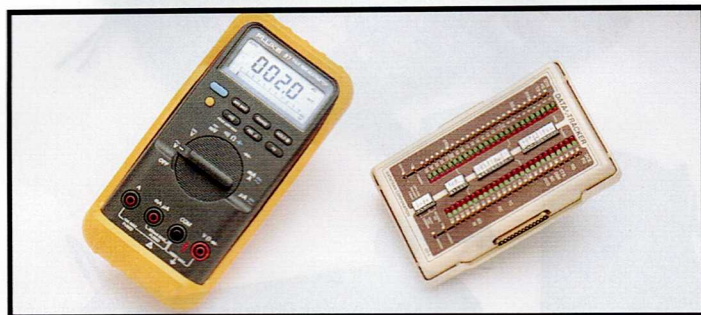
ESD Computer Service Kit

The SPC-290 is a service kit designed for those who must consider ESD an important element in selecting a tool kit. It builds on the proven success of our most popular zipper-type kits, the SPC-250 Series. The most important static-control accessories make the SPC-290 perfect for specialized computer peripheral field service plus a host of other applications.

Designed in cooperation with a major third-party service organization, the SPC-290 contains all the tools necessary for repair and adjustment. Screwdrivers, nutdrivers, ignition-type wrenches, pliers, cutters and soldering tools are uniquely teamed with special static-control equipment including an ESD wrist strap, work mat, ground cord and ESD ground receptacle adapter.

The SPC-290 comes packaged in our 890 two-sided, teal/gray Cordura zipper case. It has two half-width and one full-width exterior pouches. Durable Cordura provides a soft, lightweight but rugged shell for tools, instruments, spare parts, etc. Heavy-duty, plastic zippers separate the kit into two main compartments. In one side, you'll find our full complement of tools and equipment. The other side features a folio compartment unique to soft cases of this type. The folio's special conductive vinyl accordion design accommodates a broad range and variety of pcbs up to 16" x 10" x 1.5".

This 12-pound kit measures 18" x 11" x 5". Tools come with lifetime warranties; the case has a one-year warranty. The SPC-290 tool kit is available with an optional Fluke 87 DMM and/or DT-5 Breakout Box.



Model No.	Description	Qty.	Tool Kit Only	Tool Kit w/ Fluke 87	Tool Kit w/ DT-5	Qty.	082X890 Cordura Case Only
SPC-290	ESD Computer	1	\$365.00 ea.	\$700.00 ea.	\$604.00 ea.	1-5	\$119.00 ea.
	Service Kit	2-5	347.00 ea.	672.00 ea.	572.00 ea.	6-24	106.00 ea.
		6-11	329.00 ea.	647.00 ea.	544.00 ea.		

TOOLS

3 Screwdriver Blades, Slot
3 Screwdriver Blades, Phillips
Miniature Screwdriver, Slot
Miniature Screwdriver, Phillips
Regular Handle
Extension, 7"
Screwholding Screwdriver
Desolder Braid
Hex Key Set, 3/64" - 3/16"

Spline Key Set
5 Ignition Wrenches, 7/32" - 7/16"
Junior Handle
Soldering Iron, 25-Watt
7 Nutdriver Blades, 3/16" - 3/8"
Offset Screwdriver, Slot
Offset Screwdriver, Phillips
Jeweler's Screwdriver

Fuse Puller, Small
Scale, 6"
Adjustable Wrench, 6"
Diagonal Cutter, 4"
Int./Ext. Ring Pliers
Slip Joint Pliers, 6"
Long Nose w/ Side Cutter, 5"
Wire Stripper, 16-26 Gauge

Rosin Solder, 60/40
Telephone Line Tester
Spring Hook Tool
Deluxe ESD Work Mat
Adjustable ESD Wrist Strap
Double ESD Ground Cord
Receptacle Analyzer with Ground
2 Torx Blades, T15 and T20
Padded Zipper Case



SPC-725

Network Maintenance Kit

Our SPC-725 Tool Kit is designed to accommodate the maintenance needs of all voice/data networks utilizing twisted-pair wiring. This is a comprehensive kit for both in-house and field personnel charged with installing, maintaining and troubleshooting even the most complex systems.



The kit includes such essential tools as a punch-down tool (for 66 and 110 blocks), a twisted-pair stripper (for shielded and unshielded cable), a deluxe modular crimp tool (with dies for two-, four-, six- and eight-position connectors) and a variety of adapters for connecting to either RS-232 (data) or RJ-type (voice or data). You will find all the standard repair tools including screwdrivers, nutdrivers, pliers and cutters, adjustable wrench, knife, etc. Also included are many hard-to-find tools like Torx® drivers, a completely portable butane-type soldering iron, a receptacle analyzer and modular jack tester — to name just a few. A complete listing of what's in the SPC-725 can be found in our TOOLS section below.

All of these network tools are packaged in our very attractive and super durable teal/grey zipper case. Made of genuine Cordura® material, it features three exterior pouches for carrying additional tools, test equipment or manuals. The case measures a roomy 16" x 11" x 3" and weighs 7.15 pounds fully loaded. Tools come with lifetime warranties; the case has a one-year warranty.

The SPC-725 may be purchased separately or with a new Fluke 29 DMM. You may also want to consider an optional 3M Static-Control Kit that includes a 24" x 22" mat, wrist strap with 10-foot coiled cord and 5-foot ground cord. The 3M kit fits very conveniently in one of the tool kit's exterior pouches.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ Fluke 29
SPC-725	1	\$430.00 ea.	\$629.00 ea.
<i>Network</i>	2-5	408.00 ea.	603.00 ea.
<i>Tool Kit</i>	6-11	388.00 ea.	577.00 ea.
600X800			
<i>3M 8501</i>	1-11	\$49.95 ea.	
<i>Static-Control</i>	12-up	47.50 ea.	

Kit Only

Tool Case Only (No Tools)

082X866 866 Case.....1-5, \$60.00 ea.; 6-24, \$54.00 ea.

TOOLS

Electrician's Scissors
Adjustable Wrench, 6"
Measuring Tape, 8'
Diagonal Flush Cutter, 5"
Long Nose Plier, 5 1/2"
Precision Knife
Regular Handle
Nutdriver Blade, 3/16"
Nutdriver Blade, 1/4"
Nutdriver Blade, 5/16"

Nutdriver Blade, 3/8"
Slot Screwdriver Blade, 1/8"
Slot Screwdriver Blade, 1/4"
Slot Screwdriver Blade, 5/16"
Phillips Screwdriver Blade, #0
Phillips Screwdriver Blade, #1
Phillips Screwdriver Blade, #2
Torx Blade, #T10
Torx Blade, #T15
Blade Extension, 4"

Pocket Slot Screwdriver, 3/32"
Hex Key Set, 7-pc.
Twisted-Pair Wire Stripper
25 Modular Plugs, 4-Pos.
25 Modular Plugs, 8-Pos.
Cable Cutter, 6"
Ball Pein Hammer
Portable Solder Iron (Butane)
SN60 Resin Core Solder
Desoldering Braid, 5'

D814 Punch-Down Tool
66-Type Impact Blade
110-Type Impact Blade
Receptacle Analyzer
Gender Changer, M/M
Gender Changer, F/F
RJ45 Adapter Cable, 14'
RS-232 to RJ12/45 Converter
Telephone Line Quick Tester
Deluxe Cordura Tool Case



SPC-350 Troubleshooter Tool Kit

This is the ideal kit for troubleshooting electronic systems, especially computer pcbs. It includes every tool necessary to test and repair/replace components all the way to the IC level. You get standard fastening tools, pliers/cutters, adjustable wrench, knife, etc. plus an IC test clip, conductive wrist strap, receptacle analyzer, ground soldering iron, IC insertion/extraction tool and more. The 7-pound kit is 14" x 9" x 2", and the case has a one-year warranty. A Fluke 77 DVM and/or LP-3 Global Specialties Logic Probe are optional.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ 77 Fluke	Tool Kit w/ LP-3	Tool Kit w/ 77 & LP-3
SPC-350	1	\$272.00 ea.	\$451.00 ea.	\$317.00 ea.	\$496.00 ea.
<i>Troubleshooter</i>	<i>2-5</i>	<i>258.00 ea.</i>	<i>433.00 ea.</i>	<i>301.00 ea.</i>	<i>476.00 ea.</i>
<i>Tool Kit</i>	<i>6-11</i>	<i>245.00 ea.</i>	<i>415.00 ea.</i>	<i>286.00 ea.</i>	<i>456.00 ea.</i>

Tool Case Only (No Tools)

082X830 830 Case 1-5, \$39.00 ea.; 6-24, \$35.00 ea.



TOOLS

IC Test Clip
Balldriver Allen Set, 7-pc.
Machinist Scale, 6"
Chain Nose Plier, 4 1/2"
Diagonal Cutter, 4"
Ignition Wrench Set

Trimpot Alignment Tool
T-Type Wirestripper, 22-30 AWG
Receptacle Analyzer
60/40 Rosin Core Solder
Wire Wrap/Unwrap Tool, 30 AWG
Wire Wrap Wire, 3 Colors

Desoldering Tool
Adjustable Wrench
Insertion/Extraction Tool
Conductive Wrist Strap
Soldering Iron, 25-Watt (3-Wire)
Precision Knife

Regular Handle
Nutdriver Blades, 9 3/16" - 1/2"
Slot Screwdriver Blades, 3 ea.
Phillips Screwdriver Blades, 2 ea.
Pocket Slot Screwdriver, 3/32"
Pocket Phillips Screwdriver, #0 pt.

SPC-455 Basic Tech Kit

Our SPC-455 Tool Kits are designed for the occasional user. These "mini" kits are small enough to toss into a desk drawer or slip into a briefcase without even being noticed. Everything is included to perform basic tasks including a complete range of screwdrivers, pliers and cutters, an adjustable wrench, a wire stripper — even a soldering iron and a telephone line tester! Supplied in either a blue (810) or gray (809) zipper case that measures 9" x 7.5" x 2". Every tool is secured in its own pocket, and we've included a small pouch (5" x 3") to accommodate additional small tools or parts. Available with an optional Exttech #381625 pen-type DMM.



TOOLS

Metal Scale, 6"
Chain Nose Pliers, 4"
Small Diagonal Cutter, 4"
Long Nose Pliers w/ Cutter, 6"
Adjustable Wrench, 4"
Soldering Iron, 25-Watt
Screwdriver Handle
Slot Screwdriver Blade, Small

Slot Screwdriver Blade, Medium
Phillips Screwdriver Blade, #0 pt.
Phillips Screwdriver Blade, #1 pt.
Phillips Screwdriver Blade, #2 pt.
Adjustable Wire Stripper
Desoldering Braid, 5' spool
Telephone Line Tester
Deluxe Fabric Zipper Tool Case

Model No.	Qty.	Tool Kit Only	Tool Kit with 381625 DMM
SPC-455B*	1	\$99.00 ea.	\$148.00 ea.
	<i>2-5</i>	<i>94.00 ea.</i>	<i>141.00 ea.</i>
	<i>6-11</i>	<i>89.00 ea.</i>	<i>134.00 ea.</i>

*Specify SPC-455B for Blue Case and SPC-455G for Gray Case.

Tool Cases Only (No Tools)

082X810 Blue 810 Case Only 1-5, \$26.00 ea.; 6-24, \$23.50 ea.
082X809 Gray 809 Case Only 1-5, 26.00 ea.; 6-24, 23.50 ea.

SPC-230 Basic Maintenance Tool Kit

The SPC-230 is our popular general-purpose tool kit for performing basic maintenance around the office or shop. It includes screwdrivers, wrenches, pliers, cutters and wire strippers. You also get a genuine Mag-Lite® flashlight, Stanley® measuring tape and magnetic screwdriver with interchangeable bits.

These useful tools are arranged in an attractive zipper tool case. Large exterior pockets hold manuals, test gear or spare parts. The 5-pound kit is 14" x 11" x 3.5", and the case has a one-year warranty. Also available with an optional Exttech 380501 DMM.

TOOLS

Slip Joint Plier, 6"
Long Nose Plier w/ Cutter, 6"
Diagonal Cutting Plier, 5"
Electrician's Scissors
Adjustable Wrench, 6"
Tape Measure, 12'
Retractable Utility Knife
Ball Peen Hammer, 4-oz.
Deluxe Screwholding Screwdriver
Magnetic Screwdriver w/ 4 Bits

Pocket Phillips Screwdriver, #0
Phillips Screwdriver, #1
Phillips Screwdriver, #2
Pocket Slot Screwdriver, 3/32"
Slot Screwdriver, 1/4"
Slot Screwdriver, 3/16"
5-Piece Wrench Set, 3/8" - 5/8"
Deluxe Wire Stripper, 10-18 AWG
Mini Mag-Lite Flashlight
Deluxe Cordura® Zipper Tool Case



Model No.	Qty.	Tool Kit Only	Tool Kit with 380501 DMM
SPC-230	1	\$200.00 ea.	\$289.00 ea.
<i>Basic Maintenance</i>	<i>2-5</i>	<i>190.00 ea.</i>	<i>275.00 ea.</i>
<i>Compact Kit</i>	<i>6-11</i>	<i>181.00 ea.</i>	<i>264.00 ea.</i>

Tool Case Only (No Tools)

082X868 868 Case 1-5, \$60.00 ea.; 6-24, \$54.00 ea.



SPC-645/650

Data Communications Tool Kits

The SPC-645/650 Tool Kits were designed for the data communications specialist. No other tool kits available anywhere address the specific requirements of the datacom engineer as well as these unique kits.

Just a quick glance tells you that these kits aren't ordinary. From the distinctive blue double-sided Cordura tool case to the exceptionally well-planned tool selection, they are truly unlike any other. For the case, we utilize a double-sided design for maximum efficiency and ease of use. We've constructed it out of the most durable material available — Cordura. Between the overall design, quality of materials and of course the extremely attractive high-tech blue color, we feel this is the most functional and attractive case we've ever offered.

But the case is certainly not the only thing special about these kits. After years of supplying tools and equipment to datacom and network companies all over the world, we've developed a tool selection to meet the requirements of this special industry exactly. All the basic adjusting and servicing tools are included. You get screwdriver, pliers/cutters, wire strippers, soldering/desoldering equipment, hex wrenches, nut-drivers, etc. We've also added such indispensable tools as two wirewrap/unwrap tools, a conductive wrist strap with a special ac plug-in ground that doubles as a receptacle analyzer, three of the most common sizes of Torx drivers, a male-to-male and a female-to-female gender changer, a 4-foot double connector RS-232 ribbon cable and a micro-patch adapter for making temporary interfaces. If you purchase the SPC-650 Tool Kit, you also receive a 66-type punch-down tool, a modular adapter plus a model 77M Tone Tracer and 200B PEI Line Aid.

The SPC-645 Deluxe Data Communications Tool Kit and the SPC-650 Professional Data Communications Tool Kit both utilize our 880 double-sided, blue Cordura zipper case. It is designed so one side contains all the tools common to both kits while the other side consists of a roomy document pouch with a business card pocket and space for the specialty tools found in the SPC-650 kit only. The case measures a full 18" x 11" x 5" with the three exterior pouches. Two are 7" x 10" x 2.5", and one is 15" x 11" x 2.5". The SPC-645 weighs 11 pounds, and the 650 is 12 pounds. Tools carry lifetime warranties; the case has a one-year warranty.

A special note: we urge you to consider purchasing an optional DT-5 Breakout Box to make these kits really live up to their potential. This very popular and useful device is fully described elsewhere in this catalog. Both kits feature special pouches designed into the case to accommodate the DT-5 along with its troubleshooting guide and accessories. An optional TS-21 Lineman's Test Set is also available with each kit with or without the DT-5. The case may be purchased separately.



Model No.	Description	Qty.	Tool Kit Only	Tool Kit with Datatran DT-5	Tool Kit with Dracon TS-21	Tool Kit with DT-5 & TS-21
SPC-645	<i>Deluxe Datacom Tool Kit</i>	1	\$410.00 ea.	\$649.00 ea.	\$615.00 ea.	\$854.00 ea.
		2-5	389.00 ea.	614.00 ea.	589.00 ea.	814.00 ea.
		6-11	370.00 ea.	585.00 ea.	565.00 ea.	780.00 ea.
SPC-650	<i>Professional Datacom Tool Kit</i>	1	\$566.00 ea.	\$805.00 ea.	\$771.00 ea.	\$1010.00 ea.
		2-5	538.00 ea.	763.00 ea.	738.00 ea.	963.00 ea.
		6-11	510.00 ea.	725.00 ea.	705.00 ea.	920.00 ea.

Tool Case Only (No Tools)

082X880 880 Double-Sided Cordura Case1-5, \$99.00 ea.; 6-24, \$89.00 ea.

TOOLS

Conductive Wrist Straps
AC Ground Analyzer
Disposable Penlight
Pkg. Cable Ties

Pocket Slot Screwdriver
Slot Screwdriver Blade, 1/8"
Slot Screwdriver Blade, 3/16"
Slot Screwdriver Blade, 1/4"
Phillips Screwdriver Blade, #0
Phillips Screwdriver Blade, #1
Phillips Screwdriver Blade, #2
Blade Extension, 10"

Desoldering Braid
Telecom Spudger
Nutdriver Blade, 3/16"
Nutdriver Blade, 1/4"
Nutdriver Blade, 5/16"
Reg. Blade Handle
Slot Screwstarter
Phillips Screwstarter
Electrician's Scissors
Magnetic Pick-up Tool
Cutter with Stripper, 6"
Pocket Pack Solder

Ball-End Hex Set
Vise Grip Plier, 6"
Soldering Iron, 25-Watt
Adjustable Wrench, 6"
Precision Knife
Diagonal Plier, 4"
Chain Nose Plier, 4"
Torx Blade, #T-10
Torx Blade, #T-15
Torx Blade, #T-20
Long Nose with Cutter, 6"
Wire Stripper, 16/26 AWG

Male/Male Gendermate
Female/Female Gendermate
RS-232 Micropatch Interface
RS-232 Double-End Cable
Telephone Line Tester
Wrap/Unwrap Tool, 22/24 AWG
Deluxe Cordura Case
66-Type Punch-Down Tool*
Modular Adapter (for TS-21)*
77M Tone Tracer*
200B Line Aid*
*Included in SPC-650 Only





SPC-330 LAN Tool Kits

Our SPC-330 Series field service kits are designed to provide the network supervisor or LAN manager with a total installation and repair solution. Working closely with several major LAN administrators, we custom-tailored the equipment found in our SPC-330 to include all the necessary tools and supplies to maintain the physical integrity of the network as well as the PCs, printers and peripheral equipment associated with it.

Now, everything you need to install premise wiring, connectorize cables, repair boards and perform all basic network troubleshooting is available in a single, compact package. We've included a complete set of network-specific tools and test adapters with all the standard tools. You get a full complement of screwdrivers, pliers/cutters, soldering iron, adjustable wrench, wire strippers, wiring scissors, etc. The kit also features round cable and wire cutter, a full set of Torx® drivers, PEI's industry standard 77M and 200EP toner/tracer combo, modular jack tester, ac outlet tester, conductive wrist strap and a huge assortment of adapters including DB25 male/female gender changers, DB25 universal cable, RJ11 and RJ45 test cables, DB25 to RJ11/45 patch connector, RJ-type extension couplers and more!



We offer our SPC-330 LAN kits in three versions and two unique Cordura® cases. Our Deluxe Double-Sided Case features two full pallets of tools and adapters on one side with a full briefcase filing insert for paperwork, manuals, etc. along with our modular pallet designed to accommodate our topology-specific tools on the other side. A full-sized exterior pouch on one side holds documentation or manuals while three divided pouches on the other side accommodate test gear or spare parts. A detachable shoulder strap provides added convenience.

Now we also offer our exclusive "3X" Deluxe Triple-Sided Case that includes all the same features as our Double-Sided Case above plus a third or center compartment for carrying even more gear.

TOOLS

Slip Joint Plier, 6"
RJ45 Extension Coupler
Long Nose Plier, 4"
RJ11 Extension Coupler
Diagonal Cutting Plier, 4"
DB25 to RJ11/45 Connector
60/40 Pocket Pak Solder
RJ45 Test Cable, 14"
Long Nose Plier w/ Cutter, 6"
RJ11 Test Cable, 14"
Electrician's Scissors

DB25 M/M Gender Changer
Adjustable Wrench, 6"
DB25 F/F Gender Changer
Slot/Phillips Screwdriver
Telephone Line Tester
Professional Solder Iron, 20-Watt
Deluxe Parts Box
Conductive Wrist Strap
DB25 Micropatch Connector
Precision Knife
Pocket Flashlight

Pocket Phillips Screwdriver
Screwdriver, 1/8" Slot, 4" Long
Screwdriver, 3/32" Slot, 2" Long
Screwdriver, 5/16" Slot, 4" Long
Screwdriver, 0-pt. Phillips, 2" Long
Screwdriver, 1-pt. Phillips, 3" Long
Screwdriver, 2-pt. Phillips, 4" Long
Torx Driver, #T10
Torx Driver, #T15
Torx Driver, #T20
Torx Driver, #T25

Standard Ball Hex Set, 7-pc.
Metric Ball Hex Set, 6-pc.
Cable Cutter
Vise Grip Plier, 5"
Miniature Desolder Braid, 5' Roll
77M Tone Tracer
200EP Line Aid
Wire Stripper, 16-26 AWG
Receptacle Analyzer w/ ESD Ground
DB25 Universal Cable, 4'
Deluxe Two-Sided Cordura® Case





SPC-330

Basic LAN Installation and Repair Tool Kit

Our basic SPC-330 includes all the standard tools listed on the previous page in our 885 double-sided case. It does not include crimp tools or connectors. The SPC-330ST is the same kit in our new 889 "3X" triple-sided case. Both cases are durable Du Pont Cordura® in a medium gray color. The 14-pound SPC-330 is 15.5" x 10.5" x 5". The 15-pound SPC-330ST is the same basic size with an extra 3" center. Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM optional.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330	1	\$525.00 ea.	\$730.00 ea.	\$704.00 ea.
<i>Basic LAN</i>	2-5	498.00 ea.	698.00 ea.	673.00 ea.
<i>Tool Kit</i>	6-11	474.00 ea.	669.00 ea.	644.00 ea.
Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330ST	1	\$545.00 ea.	\$750.00 ea.	\$724.00 ea.
<i>LAN Tool Kit</i>	2-5	518.00 ea.	718.00 ea.	693.00 ea.
<i>in 3X Case</i>	6-11	494.00 ea.	689.00 ea.	664.00 ea.



SPC-330T

Twisted-Pair Installation and Repair Tool Kit

The SPC-330T includes all the basic tools listed in the TOOLS chart plus special tools for working in a twisted-pair environment (10BASE-T). It includes RJ11/RJ45 crimp tool and stripper, special cable stripper for both shielded and unshielded cable (even plenum), deluxe Dracon D814 (66 and 110 type) punch-down tool plus 25 each four-, six- and eight-position modular plugs. Model SPC-330T is supplied in our 885 deluxe double-sided case, and the SPC-330TT comes in our new 889 "3X" three-sided case. The 16-pound SPC-330T is 15.5" x 10.5" x 5". The 17-pound SPC-330TT is the same basic size with an extra 3" center. Each kit is available with a Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330T	1	\$705.00 ea.	\$910.00 ea.	\$884.00 ea.
<i>Std. Twisted-Pair</i>	2-5	670.00 ea.	870.00 ea.	845.00 ea.
<i>LAN Tool Kit</i>	6-11	636.00 ea.	831.00 ea.	806.00 ea.
Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330TT	1	\$720.00 ea.	\$925.00 ea.	\$899.00 ea.
<i>Twisted-Pair Kit</i>	2-5	684.00 ea.	884.00 ea.	859.00 ea.
<i>in 3X Case</i>	6-11	650.00 ea.	845.00 ea.	820.00 ea.



SPC-330E

Ethernet (Coax) Installation and Repair Tool Kit

Model SPC-330E includes all the basic items listed on the previous page plus special tools for working in a coax environment. It includes crimp tool for RG58/59/62AU coax, special Ethernet (Thick) die set, strippers for both standard RG cable and Thickwire Ethernet with 10 male plugs and female jacks for both RG58 and RG59. Model SPC-330E is supplied in our deluxe 885 double-sided case, and SPC-330ET comes in our new 889 "3X" three-sided case. The 17-pound SPC-330E is 15.5" x 10.5" x 5". The 18-pound SPC-330ET is the same basic size with an extra 3" center. Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM optional.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330E	1	\$680.00 ea.	\$885.00 ea.	\$859.00 ea.
<i>Std. Ethernet (Coax)</i>	2-5	646.00 ea.	846.00 ea.	821.00 ea.
<i>LAN Tool Kit</i>	6-11	614.00 ea.	809.00 ea.	784.00 ea.
Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-330ET	1	\$700.00 ea.	\$905.00 ea.	\$879.00 ea.
<i>Ethernet (Coax)</i>	2-5	666.00 ea.	866.00 ea.	841.00 ea.
<i>Kit in 3X Case</i>	6-11	634.00 ea.	829.00 ea.	804.00 ea.

Tool Cases Only (No Tools)

082X885	885 Double-Sided Case	.....1-5,	\$139.00 ea.;	6-up,	\$120.00 ea.
082X889	889 "3X" Case	.....1-5,	139.00 ea.;	6-up,	120.00 ea.





SPC-395

Voice and Data Site Manager's Kit

The SPC-395 is our most complete installation and repair kit for twisted-pair applications. Specially designed for the professional charged with both voice and data responsibilities, this kit offers a comprehensive selection of tools and accessories to keep your network up and running!

Everything necessary to install wiring, connect cable and perform basic troubleshooting procedures is included in the SPC-395. General purpose tools include a complete range of screwdrivers, nutdrivers, pliers/cutters, soldering/desoldering equipment, wiring scissors, adjustable wrench, a complete selection of Torx® drivers, wire strippers, standard and metric ball hex drivers and receptacle analyzer with a handy conductive wrist strap ground banana jack built in.

You also get many hard-to-find specialty tools for working with twisted-pair cable and modular connectors. These include DB25 to modular adapters, RS-232 M/M and F/F gender changers, Dracon's D814 66-type punch-down tool, PEI's industry standard 77M tone tracer and 200EP inductive amplifier, RJ11 and RJ45 modular couplers, RJ11 and RJ45 test cables, DB25 universal cable, RJ11/45 crimp/strip tool with 15 each four-, six- and eight-position modular plugs.

All the items listed in the TOOLS chart come packaged in very attractive Roto-Classic tool cases. They are supplied with two removable pallets, combination locks and full piano hinges. Their unique manufacture provides uniform thickness, even on the corners. These Roto-Classic cases feature an all-black appearance; even the valances have been coated with black epoxy. Their beautiful textured finish makes them impervious to extreme temperatures and solvents.

Choose from two case sizes. The 21-pound standard case size SPC-395 measures 18" x 12.75" x 5.5" (inside dimensions). Our 22-pound deep version SPC-395D measures 18" x 12.75" x 8.5" (inside dimensions). Tools come with lifetime warranties; cases have one-year warranties. Each kit is available with an optional Dracon TS-21 Lineman's Test Set and/or a Fluke 87 Digital Multimeter.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS-21	Tool Kit w/ Fluke 87	Tool Kit w/ TS-21 & 87
SPC-395	1	\$737.00 ea.	\$942.00 ea.	\$1072.00 ea.	\$1277.00 ea.
5" Std. Roto	2-5	695.00 ea.	895.00 ea.	1020.00 ea.	1220.00 ea.
Case Model	6-11	653.00 ea.	848.00 ea.	971.00 ea.	1166.00 ea.
SPC-395D	1	\$747.00 ea.	\$952.00 ea.	\$1082.00 ea.	\$1287.00 ea.
8" Deep Roto	2-5	700.00 ea.	900.00 ea.	1025.00 ea.	1225.00 ea.
Case Model	6-11	665.00 ea.	860.00 ea.	983.00 ea.	1178.00 ea.

Tool Cases Only (No Tools)

082X320 5" Standard Case	1-5, \$165.00 ea.; 6-24, \$150.00 ea.
082X322 8" Deep Case	1-5, 175.00 ea.; 6-24, 160.00 ea.



TOOLS

Slip Joint Plier, 6"
Long Nose Plier, 4"
Diagonal Cutting Plier, 4"
60/40 Pocket Pak Solder
Long Nose Plier w/ Cutter, 6"
Electrician's Scissors
Adjustable Wrench, 6"
Slot/Phillips Screw Starter
20-Watt Professional Solder Iron
Conductive Wrist Strap
Precision Knife
Pocket Phillips Screwdriver
Reversible Pocket Screwdriver
Tape Measure, 8'
Nut Drivers, 3/16" - 3/8" (4)
Torx Drivers, #T10-#T25 (4)
Standard Ball Hex Set, 7 pc.
Metric Ball Hex Set, 6 pc.
Pocket Flashlight
Cable Cutter

Vise Grip Plier, 5"
Miniature Desolder Braid, 5' Roll
77M Tone Tracer
200EP Line Aid
Wire Stripper, 16-26 AWG
Receptacle Analyzer w/ ESD Ground
DB25 Universal Cable, 4'
RJ11/RJ45 Extension Couplers (2)
Test Set Adapter
RJ11/RJ45 Test Cables, 14' (2)
DB25 Gender Changers (2)
Telephone Line Tester
RJ11/45 Crimper/Stripper
DB25 Micropatch Connector
66-Type Punch-Down Tools
Telco Plier w/ Wire Stripper
Slot Screwdrivers, (3)
Phillips Screwdrivers, (3)
DB25 to RJ11/45 Connector (2 ea.)
Roto-Classic Tool Case





SPC-30

Telephone Installer's Kit

The SPC-30 Telephone Installer's Kit contains all the specialized tools and equipment required to install or repair switch gear, terminal blocks, cable runs and/or most any other field-installable telephone device. It is really two kits in one. Besides a complete installer's kit or what is commonly referred to as a vehicle kit, it contains a leather lineman's pouch and belt for carrying frequently used tools directly to the work site (poles, attics, etc.).

This kit is a real workhorse. It contains virtually all the equipment necessary to complete the most difficult of telecommunications projects. Literally nothing has been left out to ensure that when it arrives at the job site your installer is ready to work. The SPC-30 has been especially popular in outfitting remote installation sites where having the right tool is essential.

Each kit is complete with all the basics necessary to perform a complete installation like wire cutters, long nose lineman's pliers, telco scissors, cushion grip screwdrivers, staple guns, 50-foot fish tape plus deluxe 814 type-66 and 110-type punch-down tool. Also includes a pair of insulated nutdrivers, insulated slot screwdriver, 3/8-inch variable speed/reversing electric drill, heavy-duty drop light with 25-foot cord and heavy-duty push drill.

All items listed below are packed in our special, all-weather (harsh environment) polyethylene 430 installer's case. Tools carry a lifetime warranty; the case has a one-year warranty. The SPC-30 case measures a full 17.25" x 13.75" x 9" (inside dimensions) and weighs 37 pounds with tools. It is available with an optional HD-110 DMM and/or TS-21 Test Set.

Model No.	Description	Qty.	Tool Kit Only	Tool Kit w/ HD-110	Tool Kit w/ TS-21	Tool Kit w/ HD-110 & TS-21
SPC-30	Telephone	1	\$840.00 ea.	\$1025.00 ea.	\$1045.00 ea.	\$1230.00 ea.
	Installer Kit	2-5	799.00 ea.	979.00 ea.	999.00 ea.	1179.00 ea.
		6-11	760.00 ea.	936.00 ea.	955.00 ea.	1131.00 ea.

TOOLS

Diagonal Plier w/ Stripper
Long Nose Plier, 6"
Electric Drill, 3/8"
Drop Light, 25'
Cable Ring Tool
Wire Wrap Tool, 22/24 AWG
Unwrap Tool, 22/26 AWG
Adjustable Wrench, 8"
Electrician's Tape
Drill Bit Set
Insulated Screwdriver
Telephone Line Tester

Lineman's Plier, 7"
Lineman's Pouch
Lineman's Belt
Cam Wrench w/ Stripper
Bradley-Type Wire Stripper
Cable Cutter, Heavy-Duty
Electrician's Knife
Soldering Iron, 40-Watt w/ Tip
Staple Gun, 1/4"
Pkg. of Staples (1M), 7/16"
Staple Gun, 1/2"

Box of Staples (1M), 5/8"
Punch-Down Tool, 66-Type
Type "110" Blade
Universal Release Tool
Fish Tape, 50'
Lamp Extractor
Rosin Core Solder
Screwdriver, 3/16" x 4"
Screwdriver, 3/16" x 6"
Screwdriver, 3/16" x 6"
Phillips Screwdriver, #1 Pt.

Phillips Screwdriver, #2 Pt.
Nutdriver, 1/4"
Nutdriver, 3/16"
Awl, Cushion Grip
Hacksaw, 12"
Hammer, Claw
Steel Tape, 12'
Electrician's Scissors
Scissor Holder
Push Drill
Plier, Insulation Skinner
Installer's Tool Case



SPC-260

Basic Telecom Installation Kit

The SPC-260 Basic Telecom Installation Kit was designed specifically for telephone equipment installers. All the necessary tools and test equipment required to install electronic telephone systems are supplied including a Dracon 66-type punch-down tool, a heavy-duty push drill with assorted bits, a complete selection of basic hand tools including wire stripper, diagonal cutting plier and long nose plier plus a full range of fixed-handle screwdrivers. Special provisions have also been made to accommodate the 77M Tone Tracer and 200B Line Aid.

All the tools and equipment included in our SPC-260 are assembled and packaged in our deluxe 868 brown Cordura® zipper tool case. Features include specially designed pockets for a lineman's test set, a digital voltmeter, toner/tracer units and a push drill — plus many more! For more complete information about our 868 tool case, please refer to the Tool Case section of this catalog.

The SPC-260 measures 14" x 11" x 3.5" and weighs 7 pounds with all the items listed below. Tools carry a lifetime warranty; the case has a one-year warranty. Available with an optional Fluke 77 DVM, Dracon TS-21 Lineman's Test Set, GN Nettest Datacheck 2 Breakout Box or all three.



Model No.	Description	Qty.	Tool Kit Only	Tool Kit w/ Fluke 77	Tool Kit w/ Dracon TS-21	Tool Kit w/ GN Nettest Datacheck 2	Tool Kit w/ 77, TS-21 & Datacheck 2
SPC-260	Basic Telecom Kit	1	\$322.00 ea.	\$501.00 ea.	\$527.00 ea.	\$561.00 ea.	\$945.00 ea.
	Cordura® Case	2-5	306.00 ea.	481.00 ea.	506.00 ea.	535.00 ea.	910.00 ea.
		6-11	290.00 ea.	460.00 ea.	485.00 ea.	509.00 ea.	874.00 ea.

Tool Case Only (No Tools)

082X868 868 Cordura Zipper Case1-5, \$60.00 ea.; 6-up, \$54.00 ea.

TOOLS

Push Drill w/ Bits
Tone Tracer
Line Aid
Electrician's Scissors
T-Type Wire Stripper

Telecom Wiring Spudger
Pocket Slot Screwdriver
Pocket Phillips Screwdriver
Modular Adapter

Diagonal Cutter w/ Stripper
Long Nose Plier w/ Cutter
Adjustable Wrench, 6"
Punch-Down Tool, 66-Type

Phillips Screwdriver, #1 pt.
Phillips Screwdriver, #2 pt.
Slot Screwdriver, 1/4" x 4"
Slot Screwdriver, 3/16" x 3"
Cordura® Tool Case

SPC-33 Telephone Lineman's Kit

This tool set was derived from our SPC-30 especially for the telco lineman. All tools typically used to troubleshoot phone installations are assembled in a traditional leather pouch and belt for hands-free accessibility. Every necessary service tool is included: screwdrivers, pliers/cutters, deluxe punch-down tool, Bradley-type wire stripper, scissors, etc. Variations of this kit are used worldwide. Each tool is brand name. . . Klein, Harris, Dracon, etc. Tools carry a lifetime warranty; the pouch has a one-year warranty. Kit available with optional Wavetek HD-110 DMM and/or Dracon TS-21 Test Set.

TOOLS

Punch-Down Tool, 66-Type
Probe Pic
Bradley-Type Wire Stripper
Alignment Tool
Cushion Screwdriver, 3/16"
Cushion Screwdriver, 5/16"
Cushion Screwdriver, #1 Pt.
Cushion Screwdriver, #2 Pt.
Insulated Nutdriver, 1/4"
Insulated Nutdriver, 3/16"

Awl
Electrician's Knife
Electrician's Scissor
Tool Punch
Diagonal Cutter w/ Stripper
Lineman's Plier, 7"
Long Nose w/ Cutter
Snap Loop
Tool Belt



Model No.	Description	Qty.	Tool Kit Only	Tool Kit w/ HD-110	Tool Kit w/ TS-21	Tool Kit w/ HD-110 & TS-21
SPC-33	Telephone	1	\$226.00 ea.	\$411.00 ea.	\$431.00 ea.	\$616.00 ea.
	Lineman's Kit	2-5	215.00 ea.	395.00 ea.	415.00 ea.	595.00 ea.
		6-11	204.00 ea.	380.00 ea.	399.00 ea.	575.00 ea.

Tool Pouch and Belts Only (No Tools)

060X602 5127 Tool Pouch1-5, \$22.00 ea.; 6-up, \$20.25 ea.
060X650 5207-M Medium Belt1-5, 18.00 ea.; 6-up, 16.50 ea.
060X651 5207-L Large Belt.....1-5, 19.50 ea.; 6-up, 18.00 ea.



SPC-222

Deluxe Communication Installer Tool Kits

Our SPC-222 Series Tool Kits are our most popular zipper-type kits for telecommunications installer and repair personnel. Thousands of satisfied customers use these kits every day to handle the most challenging tasks.

Virtually every tool necessary to install or repair almost any key system, PBX, intercom system or data communications network is included in this popular family of kits. They offer all the necessary telco tools including a Dracon standard punch-down tool for 66-type blocks, telco wire insulation stripper for 22/24 AWG wire, combo 22/24 wire wrap/unwrap tool, lamp extractor and wiring spudger.

All the basic tools are also included in this deluxe series. You get long nose pliers, diagonal cutting pliers, adjustable wrench, electrician's scissors and a wide assortment of the compact "99 Series" Xcelite® screwdriver and nutdriver blades. We have even included the indispensable PEI 77M Tone Tracer and 200B Amplifier.



Now our SPC-222 Series Tool Kits come in your choice of three case styles. The SPC-222/SPC-222C basic style features your choice of either a vinyl or durable Cordura®[®] case that neatly accommodates all the tools — each in its own individual pocket. Our SPC-222X features the same tool pallet surfaces as our basic model, but we've added an entire second side of the case that includes integral clipboard and document pouches for keeping up with all the paperwork. Finally, our SPC-222T is available in our exclusive "3X" case that takes our two-sided deluxe case and adds a third roomy compartment in the center for carrying spare parts, power tools or other bulky items — all in one case!

TOOLS

Bradley-Type Wire Stripper, 22/24 AWG
Punch-Down Tool, 66-Type
Long-Nose Plier w/ Cutter
Diagonal Plier w/ Stripper
Spudger Tool

Lamp Extractor
Deluxe Wrap/Unwrap Tool, 22/24 AWG
Electrician's Scissors
Adjustable Wrench, 6"
Regular Handle

Nutdriver Blades, 1/4", 5/16"
Slot Screwdriver Blade, 1/4"
Slot Screwdriver Blade, 5/16"
Phillips Screwdriver Blade, #1 pt.
Phillips Screwdriver Blade, #2 pt.

PEI 77M Tone Tracer
200B Inductive Amplifier
Pocket Screwdriver, Phillips
Pocket Screwdriver, Slot
Zipper-Type Tool Case



SPC-222 and 222C

Deluxe Communications Installer Tool Kit

Offered in two case styles, this is our basic version of this popular kit. The SPC-222 is supplied in our brown 840 vinyl case that measures 14" x 10" x 3.5". Model SPC-222C comes in our brown 848 Cordura case and measures 14" x 11" x 3.5". It features three exterior pouches, one large and two medium sized. An optional Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM is available. Kit weighs 4.5 pounds.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-222	1	\$325.00 ea.	\$530.00 ea.	\$504.00 ea.
<i>Brown Vinyl</i>	2-5	309.00 ea.	509.00 ea.	484.00 ea.
<i>Case Model</i>	6-11	294.00 ea.	489.00 ea.	464.00 ea.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-222C	1	\$328.00 ea.	\$533.00 ea.	\$507.00 ea.
<i>Brown Cordura</i>	2-5	310.00 ea.	510.00 ea.	485.00 ea.
<i>Case Model</i>	6-11	295.00 ea.	490.00 ea.	465.00 ea.

Tool Cases Only (No Tools)

082X840	840 Vinyl Case	1-5, \$42.00 ea.; 6-up, \$38.00 ea.
082X848	848 Cordura Case	1-5, 60.00 ea.; 6-up, 54.00 ea.



SPC-222X

Deluxe, Double-Sided Communications Installer Kit

Our SPC-222X is supplied in our brown 845 double-sided Cordura case. The case measures 15" x 11" x 6" and features three exterior pouches, one large and two medium sized. An optional Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM is available. Kit weighs just 6 pounds.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-222X	1	\$369.00 ea.	\$574.00 ea.	\$548.00 ea.
<i>Brown Cordura</i>	2-5	350.00 ea.	550.00 ea.	525.00 ea.
<i>Case Model</i>	6-11	333.00 ea.	528.00 ea.	503.00 ea.

Tool Case Only (No Tools)

082X845	845 Double-Sided Case	1-5, \$109.00 ea.; 6-up, \$99.00 ea.
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SPC-222T

Deluxe, "3X" Communications Installer Kit

The SPC-222T comes in our exclusive brown 849 "3X" Cordura zipper case. This unique case is the same as our double-sided case above except we've enlarged the overall size and added a very roomy third compartment in the center for carrying additional equipment. The 849 case measures 18.5" x 12.5" x 8.5". An optional Dracon TS21 Lineman's Test Set and/or Fluke 77 DMM is available. Kit weighs about 8 pounds.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS21	Tool Kit w/ 77 DMM
SPC-222T	1	\$382.00 ea.	\$587.00 ea.	\$561.00 ea.
<i>Brown Cordura</i>	2-5	363.00 ea.	563.00 ea.	538.00 ea.
<i>Case Model</i>	6-11	345.00 ea.	540.00 ea.	515.00 ea.

Tool Case Only (No Tools)

082X849	849 "3X" Case	1-5, \$124.00 ea.; 6-up, \$112.00 ea.
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SPC-285

Deluxe Telecom Troubleshooting Kit

The SPC-285 Tool Kit was designed for the senior-level telecommunications engineer. No other tool kit addresses the specific requirements of the telecom professional as well as the SPC-285. Everything about this kit is special from the unique two-sided zipper case to the very complete assortment of tools and equipment.

We've included just about everything that might be needed on a trouble site. You get a complete assortment of screwdrivers and nutdrivers, tape measure, telco scissors, spudger, long-nose and diagonal pliers, cable cutter, wire stripper, knife and deluxe punch-down tool. But we went further and included other indispensable tools like a tone tracer (77M), line aid (200B), deluxe wire wrap/unwrap tool, Mag-Lite flashlight, telephone line tester, modular adapter and chrome push drill — to name just a few!

What really puts the SPC-285 in its own class is the unique #844 case designed expressly for this kit. The double-sided zipper case features two tool pallet surfaces on one side with document storage and a clipboard on the other. The exterior has a large document pouch for manuals, schematics and drawings on one side plus specially designed, padded pockets for a DMM and a lineman's test set on the other side. This beautiful brown Cordura case has web-type handles with a velcro closure for comfortable, padded carrying.

The SPC-285 comes complete with all the tools and equipment listed in the chart below. It measures 16" x 11" x 5" and weighs 12 pounds fully loaded. Tools come with a lifetime warranty; the case has a one-year warranty. The SPC-285 may be purchased with an optional Fluke 87 DMM and/or a TS-21 Lineman's Test Set.

Model No.	Description	Qty.	Tool Kit Only	Tool Kit w/ 87	Tool Kit w/ TS-21	Tool Kit w/ 87 & TS-21
SPC-285	Deluxe Telecom	1	\$548.00 ea.	\$883.00 ea.	\$753.00 ea.	\$1088.00 ea.
	Troubleshooting	2-5	515.00 ea.	840.00 ea.	715.00 ea.	1040.00 ea.
	Kit	6-11	484.00 ea.	802.00 ea.	679.00 ea.	997.00 ea.

TOOLS

Bradley-Type Wire Stripper, 22/24 AWG
Punch-Down Tool, 66-Type
Modular Adapter
Cam Wrench Tool, 22 AWG
Tone Tracer
Line Aid
High-Leverage Cable Cutter
Long-Nose Plier w/ Cutter

Diagonal Plier w/ Stripper
Spudger Tool
Lamp Extractor
Deluxe Wrap/Unwrap Tool, 22/24 AWG
Electrician's Scissors
Adjustable Wrench, 6"
Regular Handle
Nutdriver Blade, 1/4"

Nutdriver Blade, 5/16"
Nutdriver Blade, 1/2"
Slot Screwdriver Blade, 1/4"
Slot Screwdriver Blade, 5/16"
Phillips Screwdriver Blade, #1 pt.
Phillips Screwdriver Blade, #2 pt.
Pocket Screwdriver, Phillips
Pocket Screwdriver, Slot

Cable Sheath Slitter
Chrome-Plated Push Drill
Tape Measure, 12'
"AA" Mini Flashlight
Electrician's Knife
Telephone Line Tester
Cable Ties, Pouch of 50
Two-Sided Telecom Case



SPC-277

Telco Installation and Maintenance Kit

Our SPC-277 is designed primarily for installing and maintaining telephone switch and user equipment. We supply variations of this kit to some of the largest telcos in the world. Every required tool is included as standard equipment. You get a full set of cushion-grip screwdrivers, a variety of pliers and cutters, heavy-duty cable cutter, wire stripper, soldering iron and crimping tool (with dies for four-, six- and eight-position plugs) — to name just a few. We've also included items like one of Harris Dracon's new D914 punch-down tools (with 66 and 110 blades), a deluxe wire wrap tool with 22/24 bits and our exclusive FSK static-control field kit.

All of this is supplied in our 082X509 Cordura® zippered tool case that's an attractive gray color. It is designed to accommodate all of the unique tools and equipment in an organized and efficient manner including the optional lineman's test set and DMM. Additionally, three large exterior pouches accommodate documentation, spare parts or other large items.

Model SPC-227 comes completely assembled with all the tools listed below. It weighs 13 pounds and measures 17.5" x 12" x 4" with tools. This kit may be purchased with an optional TS-21 lineman's test set or Tektronix 157 DMM. The case also may be ordered separately. Tools come with lifetime warranties; the case has a one-year warranty.

Model No.	Qty.	Tool Kit Only	Tool Kit w/ TS-21	Tool Kit w/ 157 DMM
SPC-277	1	\$595.00 ea.	\$800.00 ea.	\$694.00 ea.
Telco Installation	2-5	\$65.00 ea.	\$65.00 ea.	\$62.00 ea.
and Maintenance Kit	6-11	\$37.00 ea.	\$72.00 ea.	\$63.00 ea.

Tool Case Only (No Tools)

082X509 509 Case.....1-5, \$79.00 ea.; 6-24, \$71.50 ea.



TOOLS

Utility Pliers, 10"
Chain Nose Pliers, 4"
Diagonal Cutting Pliers, 4"
Wire Solder
Long Nose Pliers with Cutter, 6"
Diagonal Cutting Telco Pliers, 5"
Cushion Grip Slot Screwdriver, 3/16 x 6"
Cushion Grip Slot Screwdriver, 1/4 x 4"

Cushion Grip Slot Screwdriver, 1/4 x 6"
Cushion Grip Phillips Screwdriver, #1 pt.
Cushion Grip Phillips Screwdriver, #2 pt.
High Leverage Cable Cutters
Electrician's Scissors
Magnetic Retriever with Mirror
Soldering Iron
Slot Screwdriver, 1/8 x 4"

Manual Wire Wrap Gun
Wire Wrap Bit, 22/24 AWG
Wire Wrap Sleeve
Cut/Strip Tool, 22/24 AWG
Hand Unwrap Tool, 20-26 AWG
4-Position Modular Plugs, pkg./25
6-Position Modular Plugs, pkg./25
8-Position Modular Plugs, pkg./25

Telecom Crimp Tool, RJ11/RJ45
D914 Punch-Down Tool
66/110-Block Impact Blades
Plastic Parts Box
Anti-Static Field Service Kit
Telephone Line Tester
Deluxe Cordura® Zipper Case

**HARRIS
DRACON DIVISION**

DBK-814 Kit

Impact Tool and Blade Kit

The DBK-814 consists of a Harris Dracon D814™ punch-down tool and six blades in one kit. Make effortless, uniform connections with the D814 deluxe, all-in-one, telecom punch-down tool. Its adjustable impact wheel has high and low settings for any type of termination. An automatic spring mechanism provides the right impact to seat and/or terminate wires. A compartment at the end of the tool stores extra blade.

This kit includes two standard type-66 blades, two AT&T Type 110/88 blades, center punch blade for making metal screw starter holes, woodscrew starter punch for use in wood or drywall and screwdriver blade. The DBK-814 comes conveniently packaged in a vinyl carrying case. It measures 8" x 4" x 2" and weighs .75 pounds.

350X960 DBK-814 Tool/Blade Kit.....1-5, \$162.50 ea.; 6-up, \$154.50 ea.



DBK-914 Kit

Impact Tool and Blade Kit

Model DBK-914 consists of a Harris Dracon D914™ punch-down tool and six blades. The D914 automatic impact tool is the only combination impact and torque tool designed to meet wire termination requirements. A specially designed handle accommodates all

D814™ blades plus the new screwdriver and adapter blades for multiple tool functions, so you don't need to carry a different tool for each block or function. Simply change the blade, and you have another tool for consistent, trouble-free block connections. The versatile, convenient D914 meets all industry requirements for wiring 110, Krone, BIX and 66 blocks.

This kit includes two standard type-66 blades, two AT&T Type 110/88 blades, center punch blade for making metal screw starter holes, woodscrew starter punch for use in wood or drywall and screwdriver blade. The DBK-914 comes conveniently packaged in a vinyl carrying case. It measures 8" x 4" x 2" and weighs .75 pounds.

350X965 DBK-914 Tool/Blade Kit.....1-5, \$171.00 ea.; 6-up, \$162.50 ea.



Xcelite®

Tool Sets

Any one of these Xcelite® tool sets could be the economical answer to a basic service function when a complete tool kit is not needed. Adding one of these fine sets to an existing kit can be the efficient solution to the space problem of having to carry a wide range of adjusting tools. Hand tools come with lifetime warranties; pouches and the soldering iron have 30-day warranties.

99-PR Roll Pouch Kit

The 15-piece Xcelite 99-PR Kit includes nine regular nutdrivers ($\frac{3}{16}$ "- $\frac{1}{2}$ "), two slotted and two Phillips screwdrivers and a regular handle. The fabric pouch measures 12.25" x 7", rolls up to 7" x 3" x 2" and weighs 2 pounds with tools.

108X125 99-PR1-5, \$63.00 ea.; 6-up, \$57.00 ea.

99-MP Multi-Purpose Kit

Xcelite's 40-piece Multi-Purpose Kit contains regular and tee handles, nine regular nutdrivers ($\frac{3}{16}$ "- $\frac{1}{2}$ "), a $\frac{1}{4}$ " magnetic nutdriver, nine allen hex drivers (.050"- $\frac{3}{16}$ "), nine bristol spline drivers (.048"-.183"), four slotted screwdrivers, three Phillips screwdrivers, a reamer and an extension blade in a canvas case. The pouch measures 21.75" x 12" and folds up to 12" x 4" x 2.5". This kit weighs 3 pounds.

108X123 99-MP1-5, \$169.00 ea.; 6-up, \$152.00 ea.

99-SM Service Master Kit

The 24-piece Xcelite Service Master Kit includes regular and stubby handles, nine regular and three stubby nutdrivers ($\frac{3}{16}$ "- $\frac{1}{2}$ "), two slotted and two Phillips screwdrivers, a reamer, an extension, a long nose plier, a 5" diagonal cutter and a 6" adjustable wrench in a canvas case. The pouch measures 24.5" x 9", folds to 9" x 5" x 3" and weighs 3 pounds with tools.

108X150 99-SM1-5, \$145.00 ea.; 6-up, \$131.00 ea.

99-SPC PC Service Kit

Twelve of the most used PC service tools come in a handy roll pouch. Xcelite tools include a 4" regular replaceable blade handle, #0 and #1 x-point, a $\frac{3}{16}$ " slot, #10 and #15 Torx®, $\frac{3}{16}$ " and $\frac{1}{4}$ " nutdriver blades along with a parts picker, tweezer, IC inserter and extraction tool. The pouch measures 14.5" x 7", folds to a compact 7" x 4.5" x 2" and weighs 2 pounds with tools.

108X153 99-SPC1-5, \$40.00 ea.; 6-up, \$36.00 ea.

99-SMW Service Master Kit with Iron

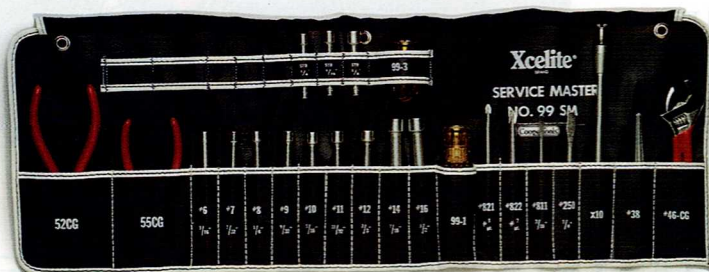
The 99-SMW is the same set as the 99-SM above except it includes an adjustable wire stripper/cutter and a 25-watt Weller soldering iron. The pouch measures 21.75" x 12" and folds to 12" x 4" x 2.5". This kit weighs 3 pounds.

108X149 99-SMW...1-5, \$190.00 ea.; 6-up, \$171.00 ea.

250K Electronics Tool Kit

This 12-piece Weller®-Xcelite starter set is ideal for the prototyper or technician. It includes a 20-watt soldering iron, two interchangeable tips, rosin core solder, solder aid tool, 4-inch cutter, 4-inch chain nose, adjustable wire stripper, $\frac{1}{4}$ " nutdriver, $\frac{3}{8}$ " x 4" slot and a #1 x 3" x-point screwdriver in a convenient storage tray. The hard plastic carrying case measures 11" x 10" x 3" with a built-in handle. This kit weighs 3 pounds.

104X005 250K.....1-5, \$96.00 ea.; 6-up, \$87.00 ea.



Weller®

NEXT-DAY DELIVERY
ONLY \$14.95!





Roto-Classic Cases

Attractive Roto-Classic cases organize, store and protect a comprehensive selection of tools and accessories. Their unique manufacture provides uniform thickness, even on the corners. Virtually indestructible, they can be checked as airline baggage to meet field service engineers' demanding schedules. Features include two removable tool pallets, combination locks and full piano hinges. These cases have an all-black appearance; even the valances are coated with black epoxy. The beautiful textured finish makes them impervious to extreme temperatures and solvents. Choose from two depths in two pallet designs. One-year warranty.

SPC Deluxe Roto-Classic Cases

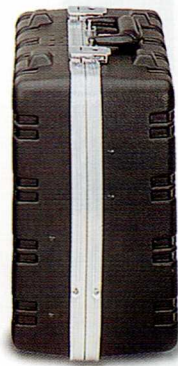
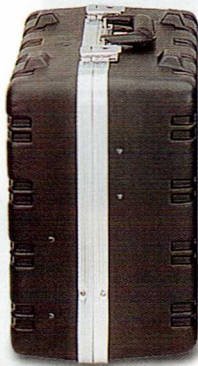
Two removable pallets are designed for the SPC-395 Voice and Data Site Manager's Kit. Individual pouches accommodate a comprehensive selection of installation and repair tools and accessories for voice and data site managers. Choose from two sizes of attractive black SPC-395 tool cases. The 12-pound 320 case is 18" x 12.75" x 5.5" (inside dimensions). Our 12-pound extra-deep 322 model is the same overall size but a full 8.5 inches deep.

082X320 320 Std. 5" Case 1-5, \$165.00 ea.; 6-24, \$150.00 ea.
082X322 322 8" Deep Case 1-5, 175.00 ea.; 6-24, 160.00 ea.

SPC Professional Roto-Classic Cases

These cases were designed for our use with SPC-99 Professional FE Series Tool Kits. They offer a versatile pallet arrangement and are very attractive. Some of the features include black anodized latches and valances, combination locks, heavy-duty handles and reinforced hinge assemblies. The 364 case is 17.5" x 12.75" x 5" (inside dimensions), and the 366 case is 17.75" x 12.75" x 8.75" (inside dimensions). Each weighs about 12 pounds.

082X364 364 Std. 5" Case 1-5, \$165.00 ea.; 6-24, \$150.00 ea.
082X366 366 8" Deep Case 1-5, 175.00 ea.; 6-24, 160.00 ea.



Super-Heavy-Duty Polyethylene Tool Cases

These are the toughest cases we offer! Our Super-Heavy-Duty (SHD) Cases are designed expressly for withstanding the rigors of torturous shipping and hazardous environments. Their black, scratch-resistant polyethylene exterior has been specially formed with extra-deep ribs that cushion even the heaviest loads.

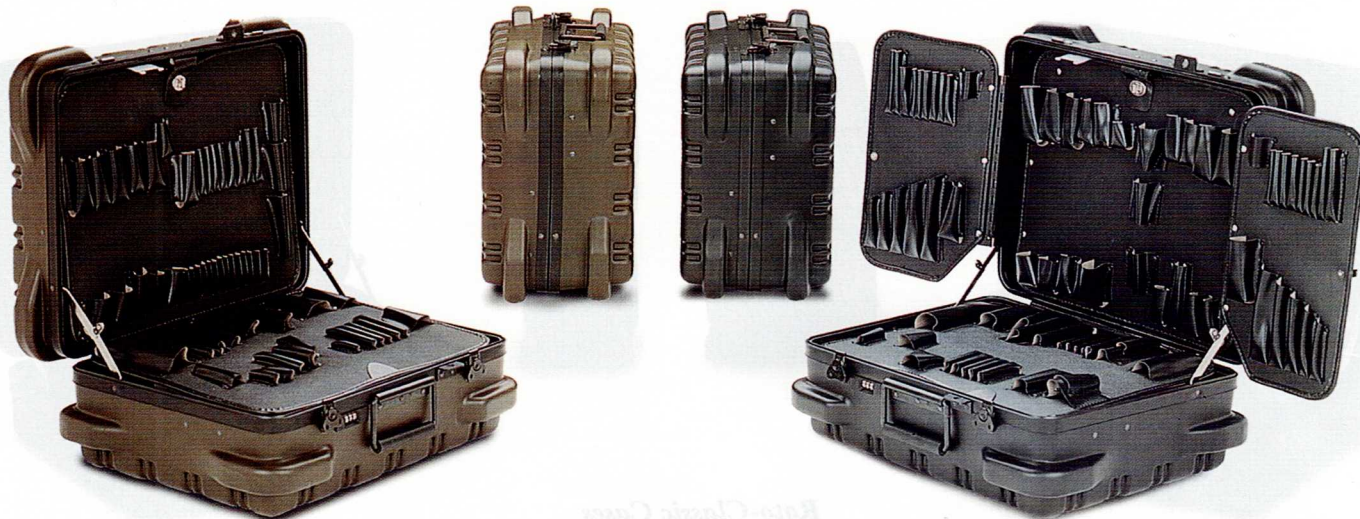
Other important features include molded-in bumper feet, document pouch in the top lid behind the pallet, Presto latches, heavy-duty handle and combination lock. These Super-Heavy-Duty Cases are designed and built to withstand whatever abuse you throw at them!

The SHD cases are black with silver hardware and valance. They feature two removable pallet surfaces that accommodate our 88-Series tools.

Pick from two sizes. The 12-pound 082X436 is the smallest at 17.25" x 13.75" x 7" (inside dimensions). It is used with our SPC-88SHD Tool Kit. The 13-pound extra large 082X439 measures 17.25" x 13.75" x 9" (inside dimensions). It comes with our SPC-88SHX Tool Kit. Both cases are designed to carry over 60 pounds of tools and equipment, making them ideal for shipping and remote-site maintenance.

082X436 436 Std. 7" Case 1-5, \$125.00 ea.; 6-24, \$113.00 ea.
082X439 439 Deep 9" Case 1-5, 135.00 ea.; 6-24, 121.00 ea.





SPC Military-Style Cases

Our extra heavy-duty Mil-Style cases borrow their heritage from military shipping containers. They are designed to be virtually indestructible in all kinds of environments under any type of use. Features include raised corners, beefed-up hinge assemblies and quarter-turn locks that fold down to prevent breaking off during shipment. Cases also have padlock hasps, combination locks (for an extra layer of security) and black anodized valances to prevent glare and corrosion. Heavy-duty, spring-loaded steel handle. We offer two styles of Military-type tool cases in traditional olive green or black. Choose from a conventional two-pallet design or our winged pallet case with 4" of diced foam below the bottom pallet.

SPC Standard Mil-Type Cases

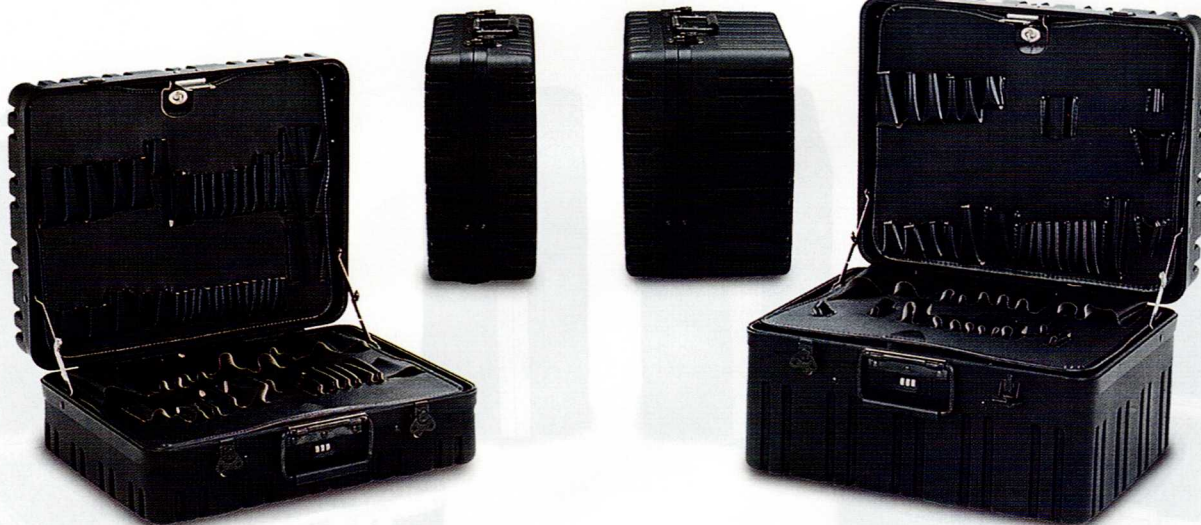
Utilizing our industry standard SPC-88 pallet configurations, our standard Mil-Style tool cases are available in either drab olive green or midnight black. Each case measures 17.5" x 13.5" x 9.5" (inside dimensions) and weighs about 13 pounds. Both cases feature two removable pallets, military-type hardware and locks. Choose from olive green (552) and black (554).

082X552 552 Olive Green Case1-5, \$160.00 ea.; 6-24, \$144.00 ea.
082X554 554 Black Case.....1-5, 160.00 ea.; 6-24, 144.00 ea.

SPC Wing Pallet Mil-Type Cases

Mil-Style cases are equipped with pallet sets utilized with our SPC-95 tool kits. The top wing-type pallet folds open to offer the pallet area of almost two full-sized surfaces. Use 4 full inches of diced foam under the bottom pallet to protect delicate equipment. Each case is 17.25" x 13.75" x 9.5" (inside dimensions). Choose from olive green (572) and black (574).

082X572 572 Olive Green Case.....1-5, \$185.00 ea.; 6-24, \$172.00 ea.
082X574 574 Black Case.....1-5, 185.00 ea.; 6-24, 172.00 ea.



SPC Roto-Rugged Cases

These special polyethylene cases are oversized and heavy-duty. We've beefed up the poly material and reworked the ribbing system to make these large cases really durable. They also feature quarter-turn latches and heavy-duty spring-loaded steel handles that enable them to carry heavy loads without fear of breaking down. Additional features include special hinges and a rough textured finish that helps prevent marring or scratching — even at extreme temperatures. Black in color with anodized black valances, these cases are very attractive as well as very strong. We offer two pallet configurations and two standard depths including our new 10" super deep model.

SPC Standard Roto-Rugged Cases

Our standard cases are used with our SPC-88WD and SPC-88WX tool kits. Featuring two removable pallet surfaces, they are quickly becoming a favorite for the engineer who needs a very heavy-duty case but doesn't want to sacrifice the traditional attaché case style. The 480 case measures 17.5" x 14" x 6" (inside dimensions) and weighs about 12 pounds. Model 482 measures 17.5" x 14" x 10" (inside dimensions) and weighs about 13 pounds.

082X480 480 6" Case Model1-5, \$155.00 ea.; 6-24, \$140.00 ea.
082X482 482 10" Case Model1-5, 165.00 ea.; 6-24, 149.00 ea.

SPC Deluxe Roto-Rugged Cases

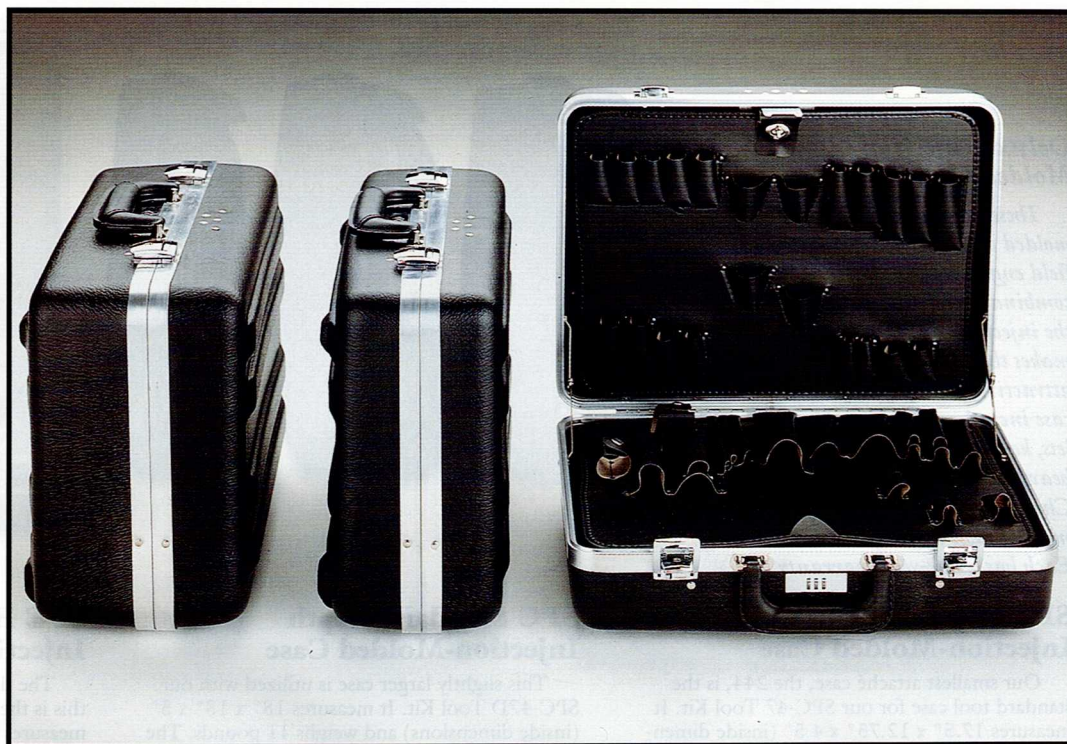
These are identical to the cases described above except the pallet configuration is from our SPC-99 Series Tool Kits. This pallet design includes some larger tool pockets and less blade-type pockets. Both cases come with quarter-turn locks, spring-loaded handles and thicker polyethylene. The 420 case is 18.875" x 15.5" x 6.25" (inside dimensions) and weighs 12 pounds. Model 422 is 18" x 15.5" x 10" (inside dimensions) and weighs 13 pounds.

082X420 420 6" Case Model1-5, \$155.00 ea.; 6-24, \$140.00 ea.
082X422 422 10" Case Model1-5, 165.00 ea.; 6-24, 149.00 ea.



Heavy-Duty Polyethylene Cases

These attractive black polyethylene cases are probably the most durable tool cases available. Made from the same tough polyethylene material used for air transport boxes, they can withstand the abuses of shipping and harsh environments. These rugged polyethylene cases come complete with two removable pallets, combination locks and Presto latches. Choose from two sizes. Each case comes with a one-year warranty.



SPC Standard-Depth Polyethylene Case

This functional case is supplied with our SPC-47HD Tool Kit. Includes two removable pallets, combination lock and Presto latches. It measures 18.25" x 13" x 7" (ID) and weighs 12 pounds. Black in color with silver hardware.

082X444 444 Case.....1-5, \$125.00 ea.; 6-24, \$113.00 ea.



SPC Heavy-Duty Polyethylene Cases

Our polyethylene cases offer the best of both worlds. Their professional appearance and rugged construction combine to make these cases a favorite of field personnel who frequently travel or work in harsh environments. We've designed them to be rugged yet attractive, unlike other polyethylene cases that look more like containerized shipping boxes than attaché cases. But we haven't compromised any of their strength. They are built to carry up to 50 pounds of tools and equipment and take the beating of day-in and day-out use without failure.

Each case features rigid polyethylene construction that is very resistant to scratching, breaking and denting; heavy-duty, positive-action Presto latches; user-settable combination locks; molded-in bumper feet and heavy-duty handles. Each case includes two removable pallets designed to accommodate our SPC-88 complement of tools plus a full-size document pouch located on the back of the top pallet.

Choose from three sizes and two colors. The 11-pound 082X416 is our basic gray polyethylene case that measures 18.25" x 13" x 7" (ID). Our 12-pound 082X417 extra-deep gray version measures 18.25" x 13" x 8.5" (ID). The 12-pound 082X427 is our high-visibility yellow model that is 18" x 14.5" x 7.25" (ID). It utilizes an extra-deep rib construction that makes it even more rugged and durable. Each case comes with a one-year warranty.

082X416 416 Case (6" Gray)1-5, \$115.00 ea.; 6-24, \$104.00 ea.

082X417 417 Case (8" Gray)1-5, 125.00 ea.; 6-24, 112.00 ea.

082X427 427 Case (7" Yellow).....1-5, 145.00 ea.; 6-24, 130.00 ea.

SPC Extra-Deep Polyethylene Case

This extra-deep case is used with our SPC-47HX Tool Kit. Includes two removable pallets, combination lock and Presto latches. It measures 18.25" x 13" x 8.5" (ID) and weighs 12 pounds. Black in color with silver hardware.

082X447 447 Case.....1-5, \$135.00 ea.; 6-24, \$122.00 ea.



Deluxe Injection-Molded Cases

These very distinctive brown molded cases are very popular with field engineers everywhere. The combination of ABS plastic and the injection-molding process makes them very durable and very attractive. Each injection-molded case includes two removable pallets, keyed Presto latches and heavy-duty molded handles. Choose from three sizes to accommodate most any requirement. Each has a one-year warranty.



SPC Ultra-Thin Injection-Molded Case

Our smallest attaché case, the 244, is the standard tool case for our SPC-47 Tool Kit. It measures 17.5" x 12.75" x 4.5" (inside dimensions) and weighs 10 pounds. Includes two removable pallets and keyed Presto latches.

082X244...1-5, \$120.00 ea.; 6-24, \$108.00 ea.

SPC Standard-Depth Injection-Molded Case

This slightly larger case is utilized with our SPC-47D Tool Kit. It measures 18" x 13" x 5" (inside dimensions) and weighs 11 pounds. The 246 comes complete with two removable pallets and keyed Presto latches.

082X246...1-5, \$130.00 ea.; 6-24, \$117.00 ea.

SPC Extra-Depth Injection-Molded Case

The deepest injection-molded case available, this is the model used with our SPC-47ED. It measures 18" x 13" x 6.5" (inside dimensions) and weighs 12 pounds. Includes two removable pallets and keyed Presto latches.

082X247...1-5, \$135.00 ea.; 6-24, \$122.00 ea.



SPC Injection-Molded Tool Cases

These tool cases have become the standard in the industry and are now our best-selling tool cases. Constructed from a high-impact polypropylene and utilizing the injection-molded manufacturing process, they are not only durable but attractive as well. Because the case shell is injection-molded, you can be sure there are no weak spots (especially in the corners) that can cause premature deterioration.

SPC cases are lightweight, rugged and very popular for all types of field service applications. Standard features include full-length piano hinged closures, heavy-duty handles, combination locks and positive-action latches. Each case is supplied with two removable pallets plus a full-size document pouch located on the back of the top pallet. Choose from two sizes and two pallet configurations, each backed by a one-year warranty.



Model 216 Standard Poly Tool Case

Our most popular ABS case, Model 216, is designed to accommodate our 88 Series tools. This two-pallet case measures 17.75" x 12.75" x 6.5" (inside dimensions) and weighs 11 pounds.

082X216 216 Case...1-5, \$105.00 ea.; 6-24, \$95.00 ea.

Model 217 Extra-Deep Poly Tool Case

This case is similar to our standard Model 216 described above, except it is a full 1.5 inches deeper. The 217 measures 17.5" x 12.5" x 7" (inside dimensions) and weighs 11 pounds.

082X217 217 Case...1-5, \$110.00 ea.; 6-24, \$99.00 ea.

Model 255 Standard Poly Tool Case

Designed to accommodate our 55 Series non-blade-type fastening tools, this two-pallet case measures 17.75" x 12.75" x 6.5" (inside dimensions) and weighs 11 pounds.

082X255 255 Case...1-5, \$105.00 ea.; 6-24, \$95.00 ea.



SPC Aluminum Tool Cases

Instantly recognizable as the ultimate in tool case designs, our distinctive aluminum cases are the choice for field engineers who demand only the best. Their strength, quality and reliability have been proven superior by the ultimate test for any product. They have faced and survived a myriad of abuses, rough handling and serious accidents while isolating and protecting their valuable contents from damage and harm.

Originally developed to provide a protective means of transporting and storing delicate electronic instrumentation, these superior cases have been adapted to function as tool cases that afford both excellent protection and a highly professional appearance.

Their brushed-aluminum finish and sleek lines are recognized worldwide as the standard for uncompromising quality. Made from seamless, wrinkle-free, deep-drawn aluminum shells, they are accented by distinctive styling bands. The clear anodized finish highlights the brushed-aluminum construction. Features include positive-locking latches to assure secure closing and fully-gasketed tongue-and-groove closure extrusions for better sealing and case integrity.

Each case has a deluxe, heavy-duty handle, full piano-hinged closure and rubber feet on both the bottom and one side to prevent unnecessary scratching. Choose from two depths in two pallet designs. One-year warranty.



SPC Prestige Case I

The Case I models are our most popular aluminum cases. Designed for our SPC-88AL and SPC-88AX Tool Kits, thousands of these cases have been sold over the years to engineers who won't settle for anything less than the best.

Two removable pallets are configured to accommodate the complement of tools in our SPC-88 Series Kits. Full piano hinges, heavy-duty handles, Presto latches and combination locks are included.

The 11-pound standard 082X077 case measures 17.5" x 12.75" x 6" (ID), and the 12-pound deep 082X177 case measures 17.5" x 12.75" x 8" (ID).

082X077 077 6" Aluminum Case1-5, **\$244.00 ea.**; 6-up, **\$224.00 ea.**

082X177 177 8" Aluminum Case1-5, **295.00 ea.**; 6-up, **270.00 ea.**

SPC Prestige Case II

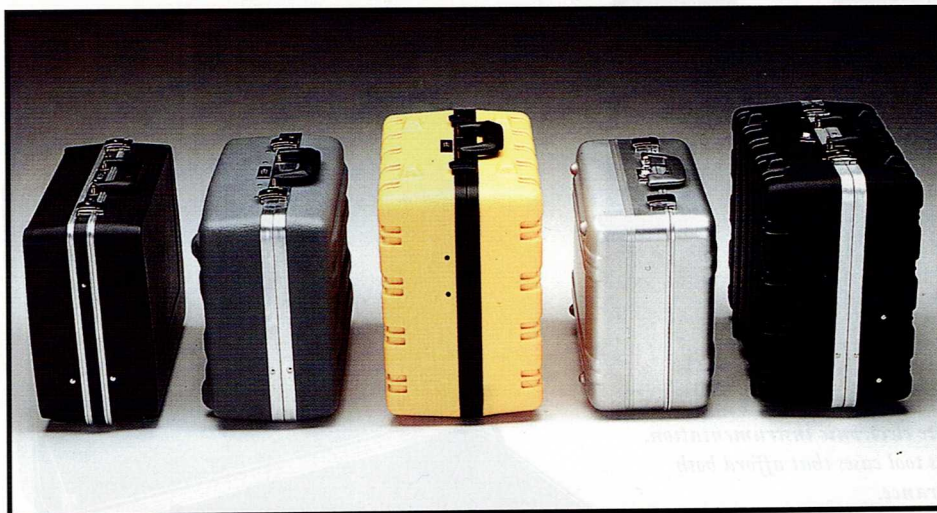
Our Case II models are supplied with two removable pallets configured for our very popular SPC-99AL and SPC-99AX Series Tool Kits. This tool complement has less pockets for blade-type tools and more general-use size pockets. All of the construction and features are the same as the Case I described at the left including the brushed aluminum finish.

The standard 11-pound 082X076 case measures 17.5" x 12.75" x 6" (ID). The 12-pound extra deep 082X176 model measures a full 17.5" x 12.75" x 8" (ID) with room for storing large pieces of test equipment.

082X076 076 6" Aluminum Case1-5, **\$244.00 ea.**; 6-up, **\$224.00 ea.**

082X176 176 8" Aluminum Case1-5, **295.00 ea.**; 6-up, **270.00 ea.**





SPC Three-Pallet Cases

We recognize that many jobs require a much wider range of tools than a standard two-pallet case can accommodate. For this reason, we offer the most extensive selection of three-pallet cases available in the industry. By adding an extra third pallet, we make it possible to carry up to 35 more tools than usual. Each additional tool is securely held in its own pocket instead of rattling around in the bottom of the case where it could be easily damaged or lost.

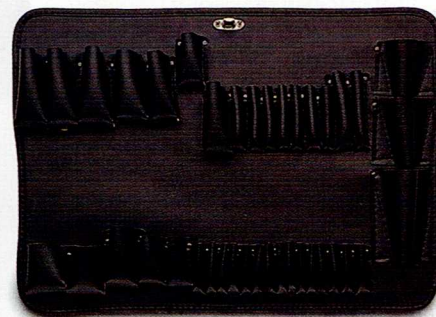
These cases are designed to accommodate our SPC-66 complement of tools. The extra pallet is conveniently tucked behind the top one so it's out of the way and doesn't interfere with test equipment or replacement parts carried in the bottom. Features include Presto latches, heavy-duty handles and three removable pallets.

Choose from five different case styles. The

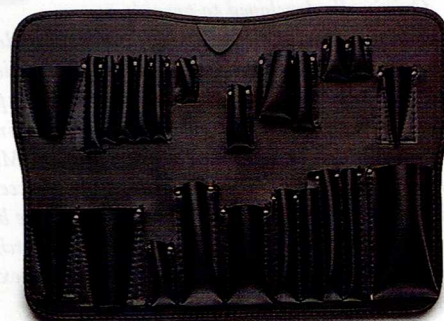
082X218 is our 13-pound, 17.5" x 12.5" x 7.25" (inside dimensions), standard, black injection-molded case. Model 082X418 is a 14-pound, 18.25" x 13" x 8.5" (inside dimensions), heavy-duty, gray polyethylene version. The 082X428 is our 15-pound, 17.5" x 12.5" x 8.75" (inside dimensions), heavy-duty, high-visibility yellow polyethylene case. Model 082X178 is the 13-pound, 17.5" x 12.5" x 8" (inside dimensions) brushed aluminum style. The 082X238 is our very own 16-pound, 18" x 14.75" x 9" (inside dimensions) black polyethylene case for carrying special instruments. It features a pop-up tray so test equipment can be used without removing it from the case.

These styles represent the most extensive and comprehensive selection of three-pallet cases in the industry! Each has a one-year warranty.

082X218	218 Case (Black ABS)	1-5,	\$125.00 ea.;	6-24,	\$113.00 ea.
082X418	418 Case (Gray Poly)	1-5,	145.00 ea.;	6-24,	132.00 ea.
082X428	428 Case (Yellow Poly)	1-5,	165.00 ea.;	6-24,	150.00 ea.
082X178	178 Case (Aluminum)	1-5,	315.00 ea.;	6-24,	285.00 ea.
082X238	238 Case (Black Poly)	1-5,	155.00 ea.;	6-24,	140.00 ea.



TOP PALLET



LOWER PALLET



THIRD PALLET

ANDIAMO INC

The Aerospace Case by Andiamo

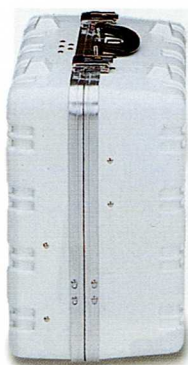
This is without a doubt the most durable tool case available anywhere at any price! It's unlike any you've ever seen before. Made of a newly developed ultra-high impact GE Xenoy-engineered thermoplastic resin, the 905 is so tough that it's backed by a lifetime warranty!

Designed to tough military specifications, it features stainless steel latches that won't rust, waterproof silicone gasket seals that absolutely will not leak and a pressure-relief valve to make it airtight! It includes a molded-in handle and bumper feet that are virtually impossible to break off. Military-type, positive-locking latches prevent the case from opening inadvertently. Two removable pallets are provided.

This 12-pound attractive charcoal-colored case is 19" x 10.5" x 7" (inside dimensions). If your requirements demand a case that absolutely cannot be destroyed, the Andiamo 905 is the one for you!

700X905 905 Tool Case1-5, \$279.00 ea.; 6-24, \$252.00 ea.





SPC Winged-Pallet Clean Room Case

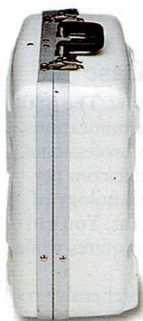
The 082X695 is a winged-pallet tool case that was created to accommodate the assortment of tools found in our very popular SPC-95 Series Comprehensive Inch/Metric Service Tool Kits. It is specially designed for clean room applications that require keeping particulate contamination to an absolute minimum.

A clean room white tool case, #695 features a heavy-duty frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include two removable (winged top and standard bottom) all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust, a combination lock as well as keyed latches.

This case will conveniently organize all the tools found in the SPC-95 Series tool kits. Weighing 15 pounds, the #695 case measures 17.25" x 13.75" x 9" (inside dimensions). One-year warranty.

Winged-Pallet Clean Room Case

082X695 1-5, \$210.00 ea.; 6-24, \$189.00 ea.



SPC Deluxe Two-Pallet Roto Clean Room Case

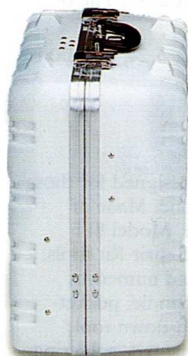
Model 082X634 is our deluxe Roto-Classic style clean room case built to accommodate our best-selling SPC-88 Series Field Service Engineer Tool Kits. It is specially designed for clean room applications that require keeping particulate contamination to an absolute minimum.

Our white #634 tool case features an anodized frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust and military-style (quarter-turn) latches.

This case will conveniently organize all the tools found in the SPC-88 Series tool kits. Weighing 11 pounds, the #634 case measures 18" x 12.75" x 5.5" (inside dimensions). One-year warranty.

Deluxe Two-Pallet Roto Clean Room Case

082X634 1-5, \$220.00 ea.; 6-24, \$198.00 ea.



SPC Heavy-Duty Three-Pallet Clean Room Case

The 082X618 is our heavy-duty three-pallet clean room tool case created to accommodate our SPC-66 Series Deluxe Field Service Tool Kits. It is specially designed for clean room applications that require keeping particulate contamination to an absolute minimum.

Our white #618 tool case features a heavy-duty frame with a specially treated white polyethylene that helps prevent the accumulation of contaminants. Other features include all-vinyl pallets designed to withstand continuous solvent cleaning, a unique valance that seals against dust, a combination lock as well as keyed latches.

This case will conveniently organize all the tools found in SPC-66 Series tool kits. At 13 pounds, the #618 case is 17.5" x 14" x 8.75" (inside dimensions). One-year warranty.

Heavy-Duty Three-Pallet Clean Room Case

082X618 1-5, \$205.00 ea.; 6-24, \$185.00 ea.





SPC Cordura Two-Sided CSR Tool Case

The 875 two-sided zipper case is the ideal solution to an old problem. Carry tools, test equipment and documentation into the field without lugging around assorted cases. This model is two cases in one. One side is for our SPC-250 Series Tool Kit tool complement. The other is tailor-made for schematics, manuals, call reports or any documentation required on site.

Model 875 is designed for the customer service rep to carry all necessary documentation with tools, test equipment and spares in a single zipper-type tool case. One side has ample room for almost any selection of electronic-type fastening tools. The other side has a large 9" x 12" document pouch, low-profile clipboard, business card pocket and several smaller pockets for pens, pencils and calculator. By combining the best features of an attaché case and a zipper-type tool case, the 875 lets the field engineer carry all necessary tools, equipment and documentation on-site in one compact, attractive case.

Durable Cordura® is virtually indestructible and wears extremely well. Midnight black in color, it features web-type handles with cushioned hand grip for comfortable carrying. The 5-pound case is 18" x 11" x 5" with three exterior pockets for additional test gear, spares or documentation. Two pockets are 7" x 10" x 2.5"; one is 15" x 11" x 2.5". One-year warranty.

082X875 875 Case.....1-5, \$99.00 ea.; 6-24, \$89.00 ea.



SPC Cordura Two-Sided Datacom Tool Case

This is really a unique case intended for data communications. The 880 was designed especially for our SPC-645/SPC-650 Data Communications Tool Kits. It has proven to be the favorite case of the datacom professional. If your job involves installation of modems, muxes, LANs or datacom networks, this is the perfect case. We've adapted the two-sided technology of our phenomenally popular 875 case to the datacom environment. You can carry all those special tools and equipment that only your job requires while enjoying the convenience of a single zipper-type tool case.

The 880 is actually two cases in one. It functions as a comprehensive tool case and small attaché case for carrying documentation. We've allowed space for all basic electronic adjusting tools, installation tools and related equipment. And we've made room for RS-232 cables, gendermates and interfaces. This case also accommodates any popular 100-LED breakout box with manual, telephone punch-down tool, tone tracer and line aid. The roomy 9" x 12" document pouch holds schematics, service manuals or call reports plus pens and pencils, business cards and calculator.

This datacom case is made of virtually indestructible Cordura® that won't tear, scuff or shrink. Includes heavy-duty zippers and web-type handles with cushioned hand grip for maximum comfort. Even the color is a unique indigo blue. This very attractive, professional-looking case has three exterior pouches. Two are 7" x 10" x 2.5"; one is a full 15" x 11" x 2.5". The 6-pound 880 case is 18" x 11" x 5". One-year warranty.

082X880 880 Case.....1-5, \$99.00 ea.; 6-24, \$89.00 ea.

SPC LAN Installation and Repair Case

SPC's executive double-sided Cordura® zipper case is designed for those demanding a complete tool complement and briefcase in one. Made of attractive and durable Cordura, it is virtually indestructible. Model 885 accommodates our SPC-330 Series LAN Installation and Repair Kit tools.

This deluxe case is a virtual tool crib with two pallets and numerous pockets for tools and adapters on one side. It holds fixed-handle, pocket-sized replaceable blade drivers plus gender changers, punch-down tool, crimpers, IC and contact insertion/removal tools, pliers, adapters, soldering iron, telephone test set and meter. The other side's executive-style briefcase has a filing insert for paperwork and manuals. Space is allotted for pen/pencil, calculator and business card.

Sturdy gray Cordura case features black trim. Double zippers, large snaps and web interlocking handles enhance the 885. A cushioned hand grip makes it comfortable to carry. Exterior full-size document pocket is 16" x 10.5". The other side is divided into three large 5.25" x 11.5" pouches for test gear or spare parts. This 6-pound case is 17" x 11.5" x 5.5". One-year warranty.

082X885 885 Case.....1-5, \$139.00 ea.; 6-24, \$120.00 ea.



3X Zipper Tool Cases

Unique Three-Sided Cases Have Incredible Amount of Storage Space

Introducing the largest, roomiest zipper tool cases available anywhere. We've taken our most popular Cordura zippered tool cases and added a huge center compartment to increase their capacity dramatically. Side one features all the pockets and pouches to accommodate a wide variety of tools and a standard-sized DMM. Side two features either more test equipment pockets or a full-size clipboard (depending on the case) along with a legal-sized document file pouch and some smaller pockets for pens, cards, etc.

Finally, side three is a new middle compartment that expands to a full 17.5" x 11" x 4" and can accommodate a full briefcase stocked with equipment including power tools, larger pieces of test equipment, bulky manuals or even a quick change of clothes! Each case is quality made with industrial zippers, integral web-type handles and padded grips. The center compartment uses a unique heavy-duty dual zipper with cushion-grip metal handles for easy opening and closing. One-year warranty.



SPC 3X Three-Sided CSR Cordura Tool Case

We've taken our very popular SPC-250 tool configuration and created this three-sided (soft) tool case that can accommodate more tools and equipment than many attaché style cases. Our 879 case features a variety of tool pockets on one side, clipboard/file pocket on the second side and 17.5" x 11" x 4" center compartment. It is 18.5" x 12.5" x 8", weighs a bit over 3 pounds and is midnight black in color.

082X879 879 3X Tool Case.....1-5, \$125.00 ea.; 6-24, \$112.00 ea.



SPC 3X Three-Sided LAN Repair Tool Case

This is a special version of our standard LAN repair case used with our SPC-330 Series kits. It features a variety of tool pockets on one side, some larger test equipment pouches, a legal-sized file pouch on the second side and the 17.5" x 11" x 4" center compartment for carrying additional spare parts or other equipment. The 889 case measures 18.5" x 12.5" x 8", weighs a bit over 3 pounds and is a medium gray color.

082X889 889 3X Tool Case.....1-5, \$139.00 ea.; 6-24, \$120.00 ea.



SPC Cordura Site Manager's Tool Case

Just a glance tells you that this case isn't ordinary. We've used a high-tech light gray color combined with the exceptional quality of Cordura material to make the 866 case really stand apart. Designed for the complement of tools found in our SPC-300 Computer Site Manager's Tool Kit, this case has proven to be not only very attractive but extremely versatile as well. It is the perfect case for leaving on site in your computer room.

Two pallet surfaces are designed to accommodate a wide variety of typical hand tools and even some small test equipment. The 866 case features a heavy-duty zipper and web-type handles with a cushioned hand grip for maximum comfort. This 3-pound case measures a roomy 16" x 11" x 3". Three exterior pouches are provided for carrying test equipment or documentation that might be required on site. Two pouches measure 8" x 5" x 2" while the other one is a full 10" x 9" x 2". One-year warranty.

082X866 866 Case.....1-5, \$60.00 ea.; 6-24, \$54.00 ea.





SPC Computer Technician's Zipper Case

Our most popular case, the 822 is specially designed for our popular SPC-250 Computer Technician Tool Kit. This neatly organized case featuring a wide variety of sizes of high-quality stitched pockets is the standard for computer technicians. It is designed to accommodate the most commonly used tools for computer peripheral repair including a Fluke-sized digital VOM with test leads. The 822 includes a heavy-duty zipper and very durable slip-up handles. The 3-pound black 822 case measures 15" x 10.5" x 2.5". One-year warranty.

822 Case
082X8221-5, \$42.00 ea.; 6-24, \$38.00 ea.



SPC Cordura® Technician's Zipper Case

A very special version of our popular computer technician's case, the durable 828 case comes with our SPC-250 Cordura® Tool Kit. Made of lightweight, tear-resistant Cordura®, this model accommodates the same computer repair tools as our best-selling 822 case. For true versatility, we've added three exterior pockets to expand the 828's storage capacity. Two 8" x 5" x 2" instrument pouches are on one side, and a 10" x 9" x 2" document pouch is on the other. The 3-pound black Cordura 828 case measures 16" x 11" x 3". One-year warranty.

828 Case
082X8281-5, \$60.00 ea.; 6-24, \$54.00 ea.



SPC Attaché-Size Repair Case

The unique 838 fits the technical needs of medical, computer, office and electronic equipment repair technicians. Lightweight, tough Cordura® zipper style holds a wide range of tools. Accommodates two replacement-blade tool sets, DMM or socket set, test leads, English and metric L-key sets, soldering iron and flashlight. Pockets for screwdrivers, cutters, pliers, crimpers and wrenches. Exterior document pouch is 15" x 11.5"; two instrument pouches are 7.5" x 11.5". Includes heavy-duty zipper, web-type handles with cushioned hand grip and detachable shoulder strap. This 5-pound black case is 18" x 13" x 3.5". One-year warranty.

838 Case
082X8381-5, \$95.00 ea.; 6-24, \$86.00 ea.



SPC Two-Sided ESD Zipper Case

Model 890, created exclusively for our SPC-290 Tool Kit, is the only zipper-type case available with an integral (conductive) folio for static-sensitive boards and parts. Made of durable Du Pont Cordura®, one side features two tool pallet surfaces with a conductive folio on the other. Accordion design accommodates a broad range and variety of pcbs up to three 16" x 10" x 1.5" boards. Large exterior pockets provide extra storage. Web-type handles with special velcro closure doubles as soft pad for comfortable carrying even when fully loaded. The 6-pound teal gray 890 case is 18" x 11" x 5". One-year warranty.

890 Case
082X890...1-5, \$119.00 ea.; 6-24, \$106.00 ea.



Platt Cordura® Zipper Case

One of Platt's most popular cases is updated and improved for the '90s! The beautiful and lightweight 660-ZT Troubleshooter case is made of tear- and moisture-resistant Du Pont Cordura® material for years of service. Features 29 stitched and riveted vinyl tool pockets. Two medium- and one full-size attractive, functional exterior pouches accommodate DVMs, literature and manuals. Includes rugged nylon molded zipper and two heavy-duty web-type handles with comfortable leather wrap. The 3-pound midnight black 660-ZT is 13" x 10" x 2.5". One-year warranty.

660-ZT Case
073X3501-5, \$68.00 ea.; 6-24, \$61.00 ea.



SPC Workstation Repair Case

Our 818 is the perfect case for basic PC repair tools. It easily fits in a desk drawer or briefcase, so it's ideal for distributed applications where a basic tool set needs to be available at all times. This tough Cordura® zipper case accommodates a complete assortment of tools including screwdrivers, nutdrivers, hex and torx tools, soldering iron, pliers, cutters and much more — in an extremely compact size. An 8" x 7" exterior pouch holds additional equipment, manuals and paperwork. Web-like handles assure easy carrying. The 1-pound attractive blue 818 case is 9.5" x 7.5" x 2.75". One-year warranty.

818 Case
082X8181-5, \$39.00 ea.; 6-24, \$35.00 ea.





SPC Master Telecom Case

Ideal for the telecom repair technician, this compact black Cordura® case has 24 sewn tool pockets, Velcro handset holder and five small parts pouches inside. These pockets are designed to hold such specialized telecom tools as punch-down, contact insertion/extraction, wire-wrap/unwrap together with an assortment of pliers, screwdrivers and other necessary tools. Two interior straps allow this case to be hung on a hook for more handy access to its contents. It also includes a detachable shoulder strap, two exterior instrument pockets and a document pocket. The 4-pound master telecom case measures 15" x 14" x 3.5". One-year warranty.

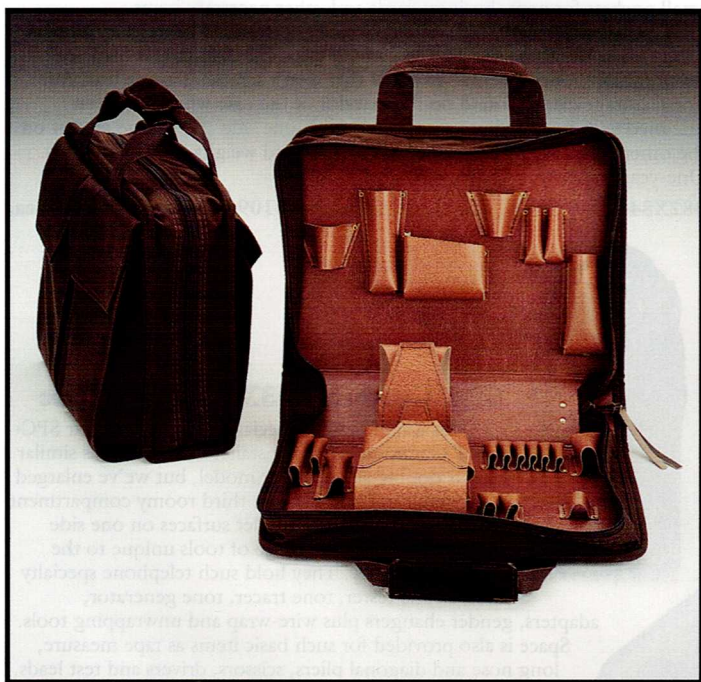
073X685 685-ZT Master Case.....1-5, \$119.00 ea.; 6-up, \$107.00 ea.



SPC Basic Telecom Case

This compact case is attractive and feature loaded. It includes two instrument pockets for a basic set of telecom tools plus a document pocket. The interior has sewn pockets to accommodate an assortment of telecom tools including meter, test set, test leads, tone tracer, tone generator, adapters and soldering iron. Space is also provided for pliers, drivers, push drill and other necessary items. Gray with black accented Cordura® exterior, the 649 case features a heavy-duty zipper. A leather piece wrapped around the two web handles provides additional carrying comfort. The 2.6-pound basic case measures 14" x 11" x 4". One-year warranty.

081X445 649 Basic Telecom Case1-5, \$89.00 ea.; 6-up, \$80.00 ea.



SPC Cordura® Communication Installers Case

Our most popular case, the 848 model is utilized with our SPC-221C and SPC-222C Tool Kits. Made of the durable and extremely long-wearing Cordura® material, this case will provide years of service. It has been specifically designed to accommodate a lineman's test set, an oversized digital volt-meter and a full complement of tools including the interchangeable blade-type screwdrivers and nutdrivers. The 848 features three exterior pockets, one large and two medium sized. It is brown in color and comes with heavy-duty web-type handles. This 3-pound case measures 14" x 11" x 3.5" and comes with a one-year warranty.

082X848 848 Case1-5, \$60.00 ea.; 6-24, \$54.00 ea.



SPC Basic Cordura® Telecom Case

The 868 case was designed for our popular SPC-260 Telecom Installer's Tool Kit. Pockets accommodate fixed-handle screwdrivers, pliers, punch-down tools, lineman's test set, DVM, toner and tracer plus full-size push drill. This durable Du Pont Cordura® case will not tear, scratch or lose its shape. It will retain its professional look even after many years of service. The exterior features pouches (two regular pockets on one side with an oversized pocket on the other) for additional equipment. Medium brown in color, it includes a heavy-duty zipper and special leather handle cushion for maximum comfort. The 3-pound case is 14" x 11" x 3.5". One-year warranty.

082X868 868 Case1-5, \$60.00 ea.; 6-24, \$54.00 ea.





SPC Telecom Cordura® Zipper Case

Specially designed for our SPC-285 Deluxe Telecom Troubleshooting Kit, our 844 case is a double-sided zipper model. It features two tool pallet surfaces on one side which accommodate a wide range of tools unique to the telephone/telecom industries. The other side features a folio-type document storage area with special pockets for pens, business cards, calculator, etc. It even includes a specially designed clipboard surface. The tool side of the 844 case will hold telephone specialty tools including line tester, tone tracer, tone generator, adapters, gender changers plus wire-wrap and unwrapping tools. Space is also provided for such basic items as tape measure, long nose and diagonal pliers, scissors, drivers and test leads.

The beautiful brown 844 case, made of genuine Du Pont Cordura®, should last for years. This rugged material is resistant to scratches, rips, tears, water and stains. The exterior features a large document pouch for carrying manuals or schematics on one side. On the other, you will find two smaller padded instrument pockets which are specially designed to hold a lineman's test set and digital multimeter. The 844 case also features web-type handles with a special padded velcro closure that provides more comfortable carrying, even when fully loaded. Measuring 16" x 11" x 5", the 844 case weighs less than 6 pounds. One-year warranty.

082X844 844 Case1-5, \$110.00 ea.; 6-24, \$98.00 ea.



SPC Two-Sided Communications Installer Zipper Case

Our 845 is the deluxe double-sided version of our most popular data-com/telecom case. It is the feature-packed case utilized by our new SPC-222T Tool Kit. The 845 case has been specifically designed to accommodate a full complement of tools including the interchangeable blade-type screwdrivers and nutdrivers along with a lineman's test set, full-size DMM and standard toner/tracer set on the TOOLS side of the case. The other side of the case features full-size clipboard along with deluxe file folio and several small pockets for pens, business cards and other necessary items.

This beautiful medium brown tool case also features heavy-duty zippers, extra strong web-type handle and padded grip. Our 845 case is made of beautiful Du Pont Cordura® material that won't scratch, fade or tear. Additional storage can be found on the exterior of the case which has been designed with two medium-sized pockets on one side and a large pocket on the other. The case measures 16" x 11" x 5" and weighs about 5 pounds. One-year warranty.

082X845 845 Case1-5, \$109.00 ea.; 6-24, \$99.00 ea.



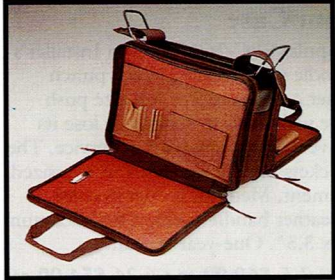
SPC Cordura® "3X" Zipper Case

This unique case is specially designed for our SPC-222T Communications Installer Tool Kit. It is similar to our double-sided zipper model, but we've enlarged the overall size and added a third roomy compartment in the center. Two tool pallet surfaces on one side accommodate a wide range of tools unique to the telecom industry. They hold such telephone specialty tools as line tester, tone tracer, tone generator, adapters, gender changers plus wire-wrap and unwrapping tools. Space is also provided for such basic items as tape measure, long nose and diagonal pliers, scissors, drivers and test leads.

The other side features a folio-type document storage area with special pockets for pens, business cards, calculator, etc. It even includes a specially designed clipboard surface. Use the spacious center compartment for carrying spare parts, power tools or other bulky items.

A beautiful brown case made of genuine Du Pont Cordura®, the 849 is very durable. This rugged material is resistant to scratches, rips, tears, water and stains. The 849 case also features web-type handles with a special padded velcro closure that provides more comfortable carrying, even when fully loaded. Measuring 16" x 11" x 5", the 849 case weighs less than 6 pounds. One-year warranty.

082X849 849 Case1-5, \$124.00 ea.; 6-24, \$112.00 ea.





SPC Installer's Case

The 430 case is our '90s version of the traditional installer's case. A special, all-weather (harsh-environment) polyethylene blends ruggedness with lightweight functionality, a must for the modern tool installer's case. We utilize this case with our SPC-30 Installer's Tool Kit. It features a top pallet for smaller, more frequently used tools and an open bottom for storage of the larger tools and equipment typically needed by the telecom installer. Built for rough handling and carrying heavy loads (up to 75 pounds!), the 430 case features deep ribbed construction, presto latches, a heavy-duty cushioned handle and a combination lock for security. The 11-pound black case measures 17.25" x 13.75" x 9" (ID). One-year warranty.

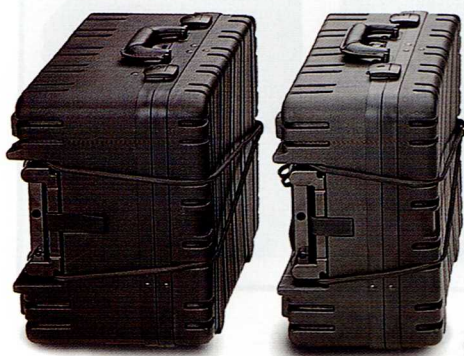
082X430 430 Case.....1-5, \$120.00 ea.; 6-24, \$105.00 ea.



SPC Remote Site Case

Our classic 220 case combines the best of yesterday's traditional styling with today's high-tech material. Designed for telecom field installers who often worked in isolated and sometimes harsh environments, today's 220 Remote Site Case is constructed of a special poly-fiber material. Built to take the abuse of rough everyday handling, this moisture-resistant material can withstand extreme temperatures. Features include two fixed, waterproof canvas tool pallets with a large storage area below the bottom pallet, all brass hardware, heavy-duty handle and reinforced corners. This black case measures 15.5" x 11.25" x 5.5" (ID). Despite its durability, it weighs just 5 pounds. One-year warranty.

082X220 220 Case1-5, \$77.00 ea.; 6-24, \$69.00 ea.



Field Service Case with Built-in Luggage Cart

We built our most popular luggage cart right into this field engineer's case so it's always there when you need it. The result is portable convenience. No assembly is required, and it contains no loose parts. Just pile on extra cases or gear, flip up the handles, lock the bar in place, and you're on your way!

This special version of our popular heavy-duty polyethylene tool case is modified to accommodate a rugged cart assembly. Low profile rubber wheels (removable) are mounted to one side for smooth rolling. Their small size makes the wheels hard to notice unless you're looking for them. The handles are recessed into the other side and are flush with the edge of the case when collapsed. We've even added a couple of small metal rails to the underside of the case to protect it from stair or curb damage. All the guts of the cart are cleverly hidden under a removable plastic tray below the bottom pallet of tools.

Individual pouches on two removable tool pallets neatly store screwdrivers, nutdrivers, pliers/cutters, hex tools, crimp tool, wire strippers, soldering iron and retaining ring pliers. A complete socket set, knives, adjustable wrenches and alignment tools are also accommodated. This case comes complete with luggage cart assembly, deluxe tie-down strap for carrying multiple cases or boxes, full-length document pouch behind top pallet and combination lock. The cart mechanism's unique design allows a full 3.5-5" of usable space below the bottom pallet in the 9" #516P case and 2-4" in the 7" #514 case.

Choose from two sizes available in black only. The 516P case measures a full 17.75" x 14.5" x 9.5" (inside dimensions) and weighs about 14.5 pounds. Model 514 is 17.75" x 14.5" x 7.5" (inside dimensions) and weighs 14 pounds. One-year warranty.

082X516 516P 9" Case1-5, \$285.00 ea.; 6-24, \$265.00 ea.

082X514 514 7" Case1-5, 280.00 ea.; 6-24, 260.00 ea.



Aerospace™ Cases by Andiamo

Innovative Military-Spec, Injection-Molded Cases

Just one look at these innovative Andiamo Aerospace cases will convince you that their design and construction are truly special. Made of tough GE Xenoy® 5220U engineered thermoplastic resin, they offer a better combination of impact resistance and rigidity (while remaining lightweight) than any material or construction in the world! Aerospace cases are completely water-tight, airtight and vaportight. They are built in compliance with Mil-Spec T-21200 (ATA 300-C), Mil-Spec 18015 (for latches) and Mil-Spec 18014 (for their air pressure relief valve). All hardware is non-rusting stainless steel.

What really makes these Andiamo cases unique is their versatility. Each case is a one-piece, solid injection-molded shell design with molded-in handles and hinges (no valances or metal frames to wear out). Additional features include stainless steel latches (that won't rust!), silicone gasket seals (that won't leak!) and Mil-Spec air pressure relief valves (that are airtight!).

Each case is filled with foam layers for easy customization to conform to whatever equipment is being transported. Available in charcoal color and two sizes. The 11-pound 21" case is 20" x 11" x 7.5" inside (21.5" x 14.5" x 8" outside). The 21-pound 28" model is 27" x 15.5" x 8.5" inside (29.25" x 19.5" x 9.13" outside). Lifetime warranty.

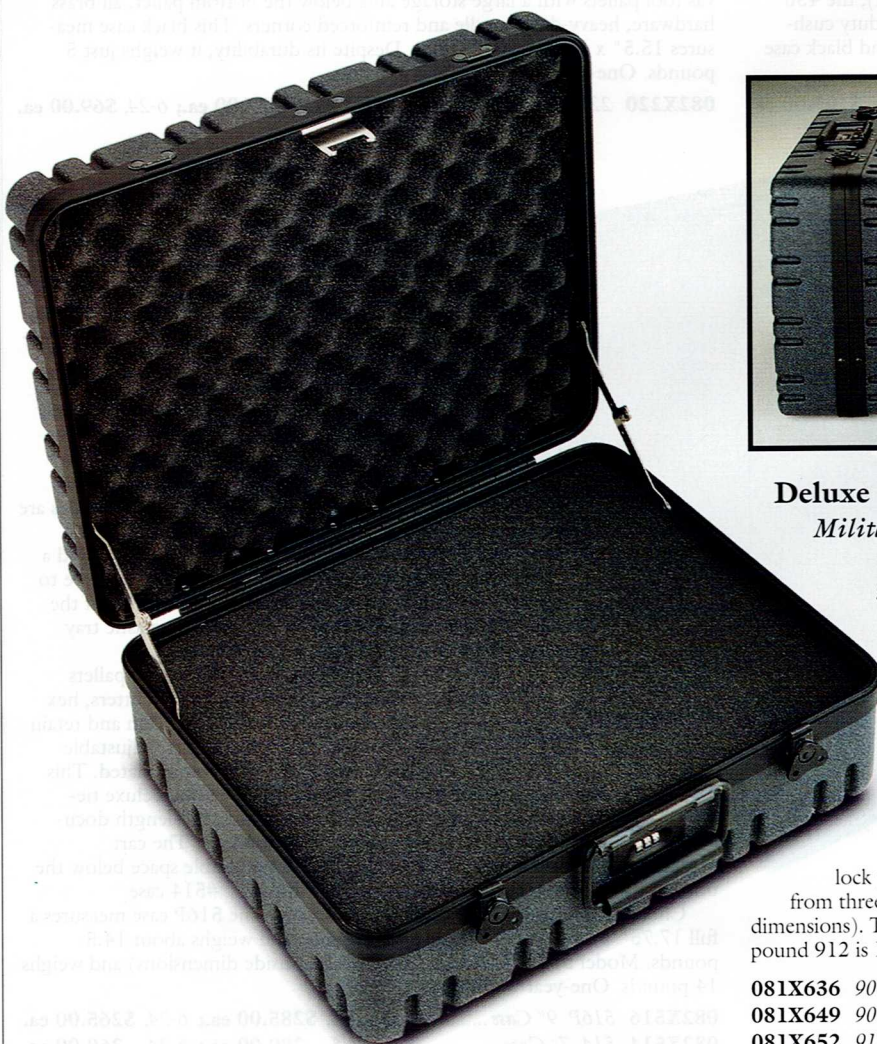
By purchasing one or more of the accessories listed at the right, each Aerospace Case can become a foam-filled transit case, shipping container, instrument case or even a full-blown tool case. Casters attach to bayonet mounting slots on each case bottom to support 200 pounds and provide easy maneuverability. Case-to-case interconnectors allow two cases to be transported as one. A collapsible two-wheel cart fits the bayonet mounting slots on each case bottom for transporting heavy loads up to 150 pounds. The case-hardened steel combination padlock fits in a molded-in ring for maximum security. A handy shoulder strap fits the 21" case only.

21" Case with Foam

700X150 AE-F21.....1-5, \$179.00 ea.; 6-up, \$165.00 ea.

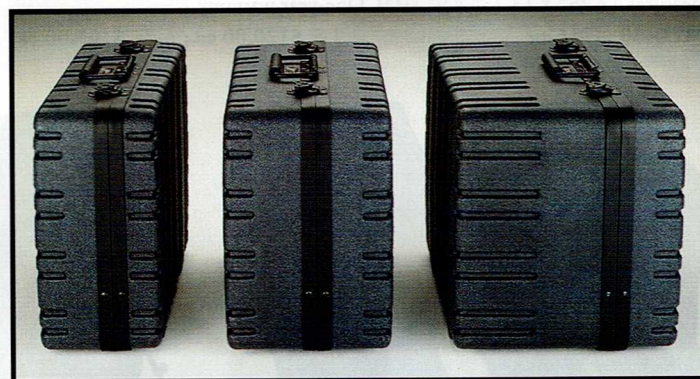
28" Case with Foam

700X156 AE-F28.....1-5, \$350.00 ea.; 6-up, \$320.00 ea.



Accessories

700X115	Aero-Caster Set of Four 1.75" (360°) Casters.....	\$ 62.00 set
700X200	AE-Inter Interconnector Set	32.00 set
700X100	AE-Cart Collapsible Two-Wheel Cart.....	162.00 ea.
700X300	AE-Lock Combination Padlock	16.00 ea.
700X800	AE-SS (CH) Charcoal-Color Shoulder Strap	12.00 ea.



Deluxe Shipping Cases

Military-Spec Type Cases with Quarter-Turn Latches

SPC is the first to introduce these rotationally-molded, blended granite cases. The 2-inch layer of rugged foam in the bottom provides a custom fit for contents. A convoluted foam layer in the top securely holds expensive and delicate computer or test equipment. Rotational molding ensures uniform wall thickness with added material strengthening the corners. The rugged shell and layered foam protect the contents by absorbing most of the energy encountered in rough baggage handling. The lowest possible profile is used in the design of these cases to prevent damage and snagging during baggage check and shipping.

Each case features black military-type quarter-turn latches, black spring-loaded handle, recessed black combination lock plus powder-coated full-length piano hinge and frame. Choose from three sizes. The 10-pound 906 is 17.8" x 14.5" x (4" + 2.3") (inside dimensions). The 11-pound 909 is 17.8" x 14.5" x (5" + 4") (ID). The 14-pound 912 is 17.8" x 14.5" x (9" + 3.5") (ID). One-year warranty.

081X636	906 6" Case	1-5, \$138.00 ea.; 6-up, \$127.00 ea.
081X649	909 9" Case	1-5, 147.00 ea.; 6-up, 135.00 ea.
081X652	912 12.5" Case	1-5, 162.00 ea.; 6-up, 149.00 ea.



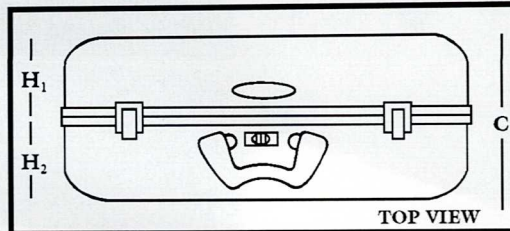
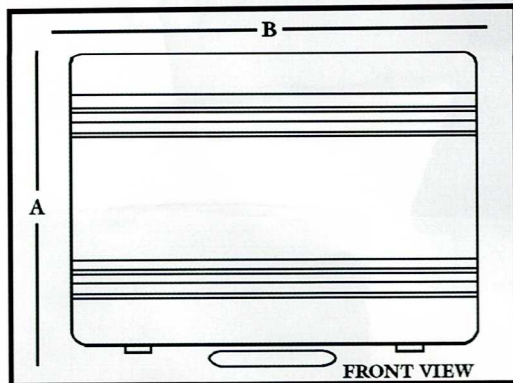


Zero Centurion Elite Carrying Cases

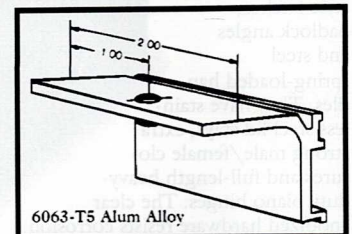
Top-of-the Line Protection and Appearance for Your Finest Equipment

High strength, light weight and clean simple lines characterize these distinctive deep drawn instrument cases. Surfaces are seamless and wrinkle free. Satin buffing and anodizing, the standard finish for the line, make the most of aluminum's natural good looks.

Zero Centurion Elite cases are dust proof, odor proof and weather resistant. Their strength and durability have been proven in actual use around the world. Each case is strong enough to stand on, owing to specially heat-treated case shells, yet even the largest size weighs less than 15 pounds.



Handle located on top of 101X, 116X and 132X cases.



6063-T5 Alum Alloy

PANEL SUPPORT BRACKET
Not installed by Zero

Handle: Injection-molded Tennite, gray.

Lock/Key: Tumbler-type/double-faced.

Latches: Two; positive seat, bail type; chrome plated.

Nameplate: Zero Corporation nameplate mounted on upper case shell above handle.

Finish: Satin buffed sulfuric acid anodized on all exposed surfaces.

Tolerances: ±.06"

Hinge: Piano type (continuous), aluminum, riveted to case; stainless steel pin.

Case Shell: Deep drawn 2024 aluminum alloy, heat treated.

Closure: Interlocking tongue and groove extrusion of 6063-T5 aluminum alloy, bonded to case shell; elastomeric gasket seal.

Feet: Aluminum, riveted to case.

Optional Accessories

M44784 — Foam pack made of gray polyurethane foam. Two-pound density-layered bottom and convoluted top (see chart below).

ZP-9183 — Adjustable panel support brackets. Specify quantity.

115X920 ZP-9183\$5.50 ea.

100X Series (standard configuration) Zero Centurion Elite Cases

Stock No.	Model No.	Prices		A	B	C	H1	H2	Net Weight	Optional Foam Pack	Stock No.	Prices	
		1-5	6-24									1-5	6-24
115X040	100X	\$135.00	\$129.00	9.00	12.00	5.00	2.00	3.00	3.31	M44784-100	115X740	\$17.00	\$14.00
115X050	101X	171.00	163.00	9.00	16.00	7.75	2.50	5.25	5.00	M44784-101	115X750	23.00	20.00
115X060	102X	163.00	155.00	13.00	18.00	4.50	2.00	2.50	5.00	M44784-102	115X760	21.00	18.00
115X070	103X	167.00	159.00	13.00	18.00	6.00	2.50	3.50	5.37	M44784-103	115X770	25.00	21.00
115X080	105X	186.00	177.00	13.00	21.00	6.50	2.75	3.75	6.12	M44784-105	115X780	32.00	27.00
115X090	106X	229.00	218.00	17.00	21.00	7.50	3.00	4.50	8.37	M44784-106	115X790	43.00	36.00
115X100	109X	255.00	243.00	18.00	26.00	8.50	3.75	4.75	10.68	M44784-109	115X800	59.00	50.00
115X110	110X	259.00	247.00	18.00	26.00	9.00	4.25	4.75	10.81	M44784-110	115X810	62.00	52.00
115X120	111X	239.00	228.00	18.00	24.00	7.00	3.00	4.00	9.50	M44784-111	115X820	49.00	41.00
115X130	112X	244.00	232.00	18.00	24.00	8.00	3.50	4.50	10.00	M44784-112	115X830	56.00	48.00
115X140	113X	246.00	234.00	18.00	24.00	8.50	4.00	4.50	10.00	M44784-113	115X840	59.00	50.00
115X150	114X	308.00	293.00	17.00	18.00	12.00	2.00	10.00	8.56	M44784-114	115X850	63.00	53.00
115X160	116X	284.00	270.00	9.00	16.00	14.50	2.50	12.00	7.18	M44784-116	115X860	46.00	39.00
115X194	129X	301.00	287.00	20.00	29.00	9.94	4.97	4.97	13.75	M44784-129	115X905	79.00	67.00
115X210	132X	324.00	309.00	8.50	19.75	14.43	1.20	13.23	8.12		N/A		

For larger quantities, contact the SPC Sales Department.

Note: Width and length are outside dimensions; height is an inside dimension.

Lower shell of Models 114X, 116X and 132X complete with spot welded wrap-around riser section.



Shipping Cases

High-Density, Reusable Shipping Containers in 100+ Configurations

- Lightweight yet tough for long life
- Fracture- and crack-resistant shells
- Excellent impact and high stacking strength
- Greatly reduced shipping costs over wood-fabricated cases

This is the industry's largest selection of rugged shipping containers. These heavy-duty cases are designed and built for air or sea transportation of valuable and sensitive electronic devices, computers and peripherals, cameras, video equipment and trade show displays. They meet Air Transport Association of America specification 300 but are only watertight, not waterproof.


Designed for rough handling, lids and bottom shells are constructed of high-density polyethylene. When dropped, this material can absorb some of the energy before it's transferred to the contents. A rubber gasket in the lid valance seals out dust and moisture.

All our shipping containers feature quarter-turn military-style latches, padlock angles and steel spring-loaded handles. They have stainless steel lid stays, extra strong male/female closures and full-length heavy-duty piano hinges. The clear anodized hardware resists corrosion.

These attractive cases have an easy-to-clean permanent white finish that's impervious to solvents. All models can be easily padlocked.

Choose from two foam packages for extra shock absorption. Foam-lined cases contain 2 inches of foam on all sides. Full-foam cases are completely filled with layered 2-inch foam. A small knife is included so you can custom cut the layers to suit your equipment. Assorted shipping decals are also included.

Our shipping cases come in four basic styles. Choose from a variety of sizes in ATTACHÉ, FOOT-LOCKER, SQUARE and COMBO styles. One-year warranty against manufacturing defects only.

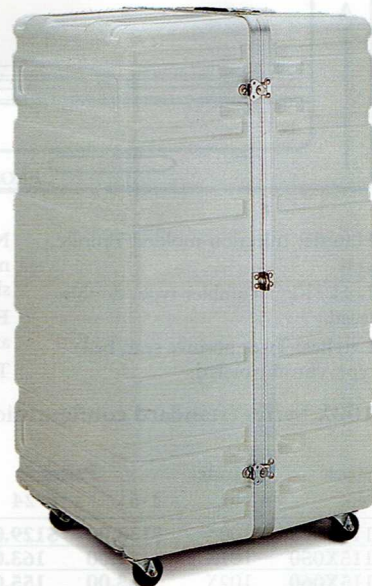
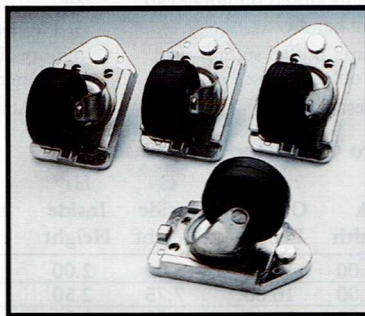
Shipped surface freight only. 

Removable Caster Kit

- Durable metal casters
- Works with all SPC White Shipping Cases
- Easily installed

Turn any of our SPC Shipping Cases into a "roll-around" case by installing our heavy-duty caster kit. Each kit includes four each 2 1/2" hard rubber wheels and a low-profile metal plate that permanently mounts to shipping case. Casters easily snap on and off for maximum versatility.

282X990 Caster Kit.....\$70.00 ea.

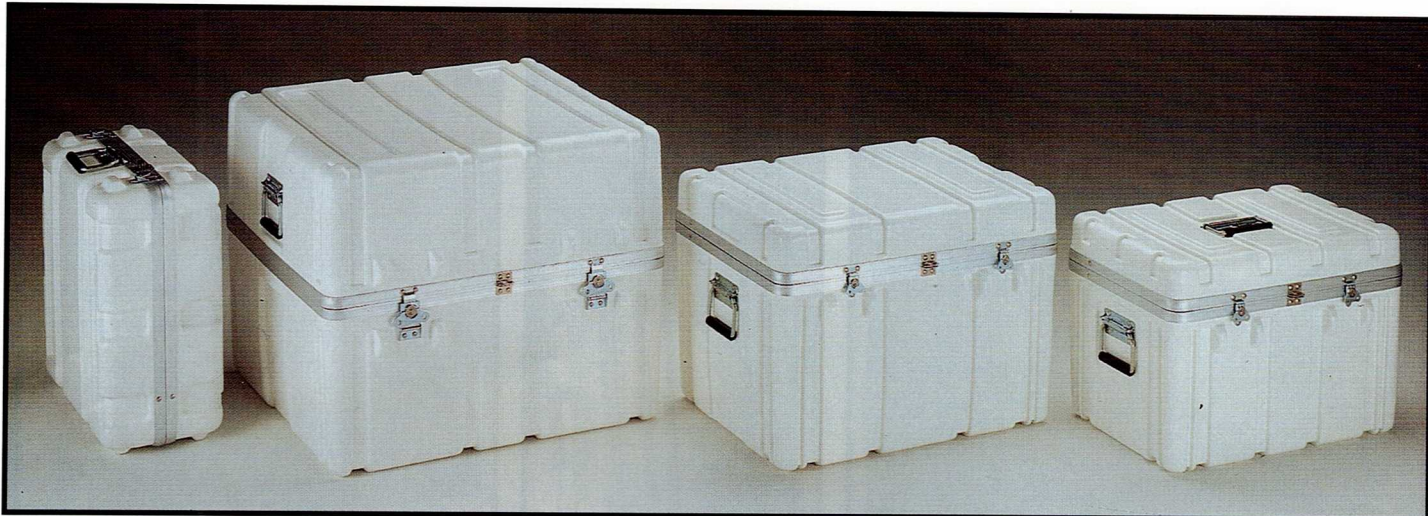


Attaché Style	2" Lined Foam				Case Dimensions (ID)	Full Foam Filled			
	Case Part #	Ship Wt.	Price 1	Price 2-5*		Case Part #	Ship Wt.	Price 1	Price 2-5*
	282X080	9	\$180.00	\$171.00	13 7/8 x 8 7/8 x (6 1/2 + 2 1/2)	282X082	9	\$180.00	\$171.00
	282X090	11	180.00	171.00	14 1/2 x 13 1/8 x (6 + 3)	282X092	11	180.00	171.00
	282X100	11	153.00	145.00	17 1/4 x 14 1/2 x (3 3/8 + 2 3/4)	282X102	11	162.00	154.00
	282X106	13	157.00	150.00	17 3/4 x 14 1/2 x (5 + 4)	282X108	14	171.00	162.00
	282X112	13 3/8	162.00	154.00	17 3/4 x 14 1/2 x (8 1/2 + 3 1/2)	282X114	15	171.00	162.00
	282X120	15	180.00	171.00	18 3/4 x 18 3/4 x (4 + 4)	282X122	15	198.00	188.00
	282X130	15	189.00	179.00	18 3/4 x 18 3/4 x (6 + 4)	282X132	17	207.00	196.00
	282X140	18	198.00	188.00	18 3/4 x 18 3/4 x (9 + 4)	282X142	21	225.00	214.00
	282X150	8	162.00	154.00	19 1/8 x 8 7/8 x (3 1/2 + 2 1/2)	282X152	8	180.00	171.00
	282X160	14	198.00	188.00	21 3/4 x 14 1/2 x (5 + 3)	282X162	15	207.00	196.00
	282X170	16	207.00	196.00	23 3/4 x 15 1/4 x (5 1/2 + 5 1/2)	282X172	17	216.00	205.00
	282X680	18	225.00	214.00	25 x 13 x (5 1/2 + 5 1/2)	282X682	19	234.00	222.00
	282X180	21	225.00	214.00	27 x 19 x (5 + 5)	282X182	24	243.00	231.00
	282X190	20	225.00	214.00	28 3/8 x 17 1/4 x (5 1/2 + 5 1/2)	282X192	23	234.00	222.00

* For 6-up prices, call for quote.

NEXT-DAY DELIVERY
ONLY \$14.95!





Footlocker Style



2" Lined Foam					Full Foam Filled			
Case Part #	Ship Wt.	Price 1	Price 2-5*	Case Dimensions (ID)	Case Part #	Ship Wt.	Price 1	Price 2-5*
282X210	10	\$189.00	\$179.00	16 x 9 x (7 + 2)	282X212	10	\$189.00	\$179.00
282X220	11	198.00	188.00	17 ⁷ / ₈ x 9 ⁷ / ₈ x (10 ¹ / ₂ + 1 ³ / ₄)	282X222	12	198.00	188.00
282X230	19	234.00	222.00	18 x 14 ¹ / ₂ x (17 + 2)	282X232	22	252.00	239.00
282X240	15	207.00	196.00	20 ¹ / ₂ x 12 ³ / ₄ x (9 + 2 ¹ / ₂)	282X242	16	225.00	214.00
282X250	13	185.00	175.00	21 ¹ / ₈ x 10 ⁷ / ₈ x (9 ¹ / ₂ + 2 ¹ / ₂)	282X252	15	216.00	205.00
282X260	25	261.00	248.00	23 ¹ / ₂ x 18 ¹ / ₂ x (14 + 3 ¹ / ₂)	282X262	29	288.00	273.00
282X270	21	243.00	231.00	25 x 13 ³ / ₈ x (12 ¹ / ₂ + 2 ³ / ₄)	282X272	23	252.00	239.00
282X280	21	252.00	239.00	28 ⁷ / ₈ x 14 ¹ / ₄ x (11 + 3)	282X282	24	270.00	256.00
282X290	23	270.00	256.00	28 ⁷ / ₈ x 14 ¹ / ₄ x (12 + 5)	282X292	27	279.00	265.00
282X300	33	351.00	333.00	34 x 25 ³ / ₄ x (13 + 3)	282X302	50	396.00	376.00
282X310	24	270.00	256.00	35 ⁵ / ₈ x 18 x (5 + 5)	282X312	25	279.00	265.00
282X320	31	288.00	273.00	35 ⁵ / ₈ x 18 x (10 + 5)	282X322	35	324.00	308.00
282X330	35	324.00	308.00	35 ⁵ / ₈ x 18 x (10 + 10)	282X332	47	387.00	368.00
282X340	24	315.00	299.00	37 x 22 x (5 + 5)	282X342	28	333.00	316.00
282X350	40	342.00	325.00	37 x 22 x (14 + 5)	282X352	48	405.00	385.00
282X360	37	333.00	316.00	38 x 22 x (10 + 2)	282X362	40	360.00	342.00
282X370	30	315.00	299.00	41 x 14 x (14 + 2)	282X372	35	360.00	342.00
282X380	36	441.00	419.00	46 x 23 x (5 ¹ / ₂ + 5 ¹ / ₂)	282X382	43	477.00	453.00
282X390	68	536.00	510.00	57 x 30 x (11 + 3) No UPS	282X392	82	627.00	595.00

Square Style



Case Part #	Ship Wt.	Price 1	Price 2-5*	Case Dimensions (ID)	Case Part #	Ship Wt.	Price 1	Price 2-5*
282X420	11	\$198.00	\$188.00	14 1/2 x 13 3/8 x (10 + 2)	282X422	11	\$198.00	\$188.00
282X430	15	198.00	188.00	15 1/4 x 14 3/4 x (6 3/4 + 6 3/4)	282X432	16	207.00	196.00
282X440	21	235.00	222.00	18 3/4 x 18 3/4 x (14 + 4)	282X442	25	261.00	248.00
282X450	23	252.00	239.00	18 3/4 x 18 3/4 x (15 + 6)	282X452	26	270.00	256.00
282X460	17	270.00	256.00	20 x 20 x (5 + 5)	282X462	20	297.00	282.00
282X470	20	288.00	274.00	20 x 20 x (8 + 5)	282X472	23	306.00	291.00
282X480	21	297.00	282.00	20 x 20 x (8 + 8)	282X482	25	315.00	299.00
282X490	24	315.00	299.00	20 x 20 x (12 + 8)	282X492	29	333.00	316.00
282X500	29	324.00	308.00	20 x 20 x (12 + 12)	282X502	33	342.00	325.00
282X510	21	288.00	273.00	22 x 22 x (5 + 5)	282X512	22	306.00	291.00
282X520	22	297.00	282.00	22 x 22 x (8 + 5)	282X522	25	315.00	299.00
282X530	25	306.00	291.00	22 x 22 x (10 1/2 + 7)	282X532	30	333.00	316.00
282X540	25	315.00	299.00	22 x 22 x (10 1/2 + 10 1/2)	282X542	30	342.00	325.00
282X550	32	288.00	273.00	24 x 24 x (15 + 2 1/2)	282X552	37	324.00	308.00
282X560	33	297.00	282.00	24 x 24 x (15 + 6 3/4)	282X562	40	351.00	333.00
282X570	42	333.00	316.00	24 x 24 x (15 + 15)	282X572	51	414.00	393.00
282X580	33	333.00	316.00	26 1/2 x 26 1/2 x (8 + 8)	282X582	40	387.00	368.00
282X590	37	342.00	325.00	26 1/2 x 26 1/2 x (12 + 8)	282X592	46	414.00	393.00
282X600	39	351.00	333.00	26 1/2 x 26 1/2 x (13 + 10)	282X602	49	432.00	410.00
282X610	41	360.00	342.00	26 1/2 x 26 1/2 x (13 + 13) No UPS	282X612	54	450.00	428.00
				27 1/4 x 24 1/4 x (3 1/2 + 3 1/2)	282X622	26	306.00	291.00

Combo Style



Case Part #	Ship Wt.	Price 1	Price 2-5*	Case Dimensions (ID)	Case Part #	Ship Wt.	Price 1	Price 2-5*
282X630	17	\$243.00	\$231.00	20 1/2 x 14 1/2 x (12 + 3)	282X632	21	\$261.00	\$248.00
282X640	20	252.00	239.00	20 1/2 x 14 1/2 x (15 + 4)	282X642	23	270.00	256.00
282X650	13	225.00	214.00	24 7/8 x 9 x (12 1/2 + 1 3/4)	282X652	14	243.00	231.00
282X660	23	252.00	239.00	24 x 24 x (7 3/4 + 2 3/4)	282X662	25	261.00	248.00
282X670	24	270.00	256.00	24 x 24 x (6 3/4 + 6 3/4)	282X672	29	297.00	282.00
282X690	22	252.00	239.00	25 x 13 3/8 x (13 + 5)	282X692	25	261.00	248.00

* For 6-up prices, call for quote.

Specify Surface Freight Only

Please don't be confused by our (surface freight) classification on these products. All of our shipping cases are designed and built to ATA specifications expressly for air or sea transport. We simply have to exclude them from our \$14.95 overnight delivery offer because of their price-to-weight ratio. Normally we ship these cases via UPS or common carrier, but we will gladly ship them by any method you specify within 24 hours of receiving your order. (Figure on about \$1.50-\$2.00 per pound for overnight air shipment.)

Call our Sales Department at (800) 866-5353 for specific information.





Deluxe Shipping Cases with Wheels

New Transport Containers in 14 Sizes

These high-density polyethylene cases with wheels enable one person to handle heavy loads easily. Designed and built to ease the transportation of valuable and sensitive equipment, our heavy-duty cases are tough enough to withstand airline baggage handling. They are ideal for installers, technicians, field engineers and sales personnel shipping electronic devices, computers, peripherals, cameras, video equipment or trade show displays.

All transit containers are lightweight yet tough for reliable convenience and long life. Recessed 2-inch diameter rubber wheels mounted on the bottom corners ensure maximum stability and cornering. These cases will not

tip over like other wheeled suitcases or ones transported on luggage carts. A telescoping handle is built into the opposite bottom edge of the case. It stores flush and telescopes to ease moving around airports and other sites.

Completely filled with 2-inch layers of dense polyurethane foam, a small knife is included to custom cut layered foam to fit contents. Each case has a convoluted lid piece and full-length, heavy-duty piano hinge. Choose from black and silver colors. Black models have coated frames and black hardware. Silver cases come with clear anodized frames and chrome hardware to resist corrosion. These easy-to-clean surfaces are impervious to solvents. Each color is available in 31 different size configurations. One-year warranty.

Shipped surface freight only.



Black Color

Case Stock #	Wgt.	Price 1	Price 2-5*
282X740	14	\$225.00	\$214.00
282X742	15	234.00	222.00
282X744	16	243.00	231.00
282X746	17	252.00	239.00
282X750	21	234.00	223.00
282X752	22	243.00	231.00
282X754	23	252.00	239.00
282X766	22	261.00	246.00
282X768	24	270.00	256.00
282X770	26	279.00	265.00
282X774	28	288.00	273.00
282X776	29	297.00	282.00
282X778	30	306.00	291.00
282X790	22	252.00	239.00
282X792	23	261.00	248.00
282X794	24	270.00	256.00
282X796	25	279.00	265.00
282X798	26	288.00	273.00
282X802	30	351.00	333.00
282X804	31	360.00	342.00
282X806	32	369.00	350.00
282X808	34	378.00	359.00
282X810	35	387.00	368.00
282X820	23	306.00	291.00
282X822	25	315.00	299.00
282X824	26	324.00	308.00
282X826	27	333.00	316.00
282X830	37	387.00	368.00
282X832	39	396.00	376.00
282X834	41	405.00	385.00
282X836	43	414.00	393.00

Case Dimensions (ID)

W x D x H (Bottom/Lid)
21.75 x 14.5 x (3.375 + 2.75)
21.75 x 14.5 x (5 + 3)
21.75 x 14.5 x (6 + 4)
21.75 x 14.5 x (6 + 6)
23.5 x 17.4 x (3 + 3)
23.5 x 17.4 x (5 + 3)
23.5 x 17.4 x (5 + 5)
23.8 x 20.6 x (3 + 3)
23.8 x 20.6 x (5 + 3)
23.8 x 20.6 x (6 + 4)
23.8 x 20.6 x (7 + 5)
23.8 x 20.6 x (7 + 7)
23.8 x 20.6 x (7.5 + 7.5)
25.4 x 17.3 x (3 + 3)
25.4 x 17.3 x (5 + 3)
25.4 x 17.3 x (5 + 5)
25.4 x 17.3 x (7 + 5)
25.4 x 17.3 x (7 + 7)
25.75 x 25.75 x (4 + 4)
25.75 x 25.75 x (6 + 4)
25.75 x 25.75 x (8 + 4)
25.75 x 25.75 x (8 + 6)
25.75 x 25.75 x (8 + 8)
27 x 19 x (6 + 4)
27 x 19 x (8 + 4)
27 x 19 x (8 + 6)
27 x 19 x (8 + 8)
29.75 x 29.75 x (6 + 4)
29.75 x 29.75 x (8 + 4)
29.75 x 29.75 x (8 + 6)
29.75 x 29.75 x (8 + 8)

Silver Color

Case Stock #	Wgt.	Price 1	Price 2-5*
282X741	14	\$221.00	\$210.00
282X743	15	230.00	219.00
282X745	16	239.00	227.00
282X747	17	248.00	236.00
282X751	21	230.00	219.00
282X753	22	239.00	227.00
282X755	23	248.00	236.00
282X767	22	257.00	244.00
282X769	24	266.00	253.00
282X771	26	275.00	261.00
282X775	28	284.00	270.00
282X777	29	293.00	279.00
282X779	30	302.00	287.00
282X791	22	248.00	236.00
282X793	23	257.00	244.00
282X795	24	266.00	253.00
282X797	25	275.00	261.00
282X799	26	284.00	270.00
282X803	30	347.00	330.00
282X805	31	356.00	338.00
282X807	32	365.00	347.00
282X809	34	374.00	356.00
282X811	35	383.00	364.00
282X821	23	302.00	287.00
282X823	25	311.00	296.00
282X825	26	320.00	304.00
282X827	27	329.00	313.00
282X831	37	383.00	364.00
282X833	39	392.00	373.00
282X835	41	401.00	381.00
282X837	43	410.00	390.00





Lift-Off Top Shipping Containers

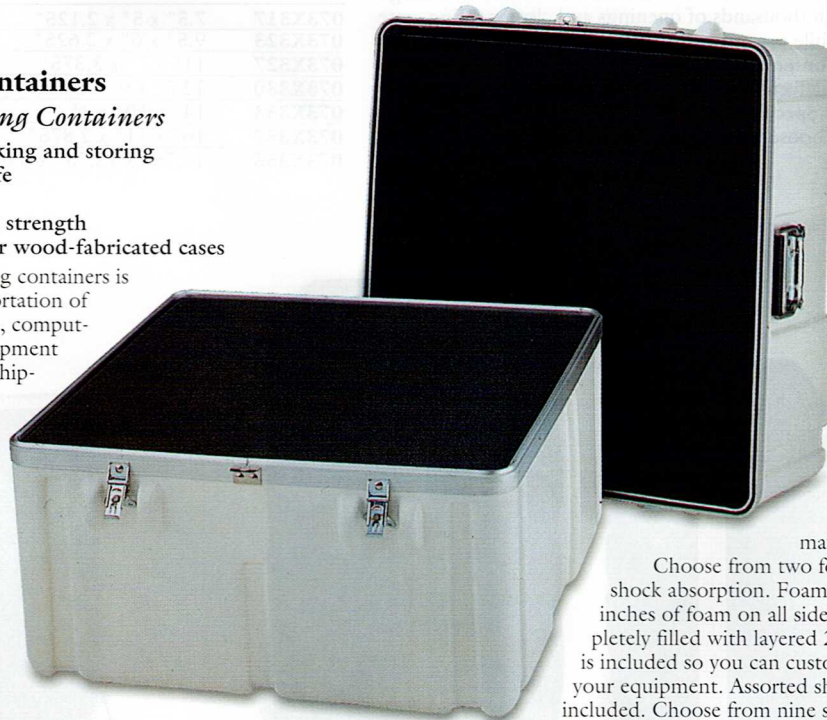
High-Density, Reusable Shipping Containers

- Removable lids for convenient packing and storing
- Lightweight yet rugged for long life
- Fracture- and crack-resistant shells
- Excellent impact and high stacking strength
- Greatly reduced shipping costs over wood-fabricated cases

This selection of heavy-duty shipping containers is designed and built for air or sea transportation of valuable and sensitive electronic devices, computers and peripherals, cameras, video equipment and trade show displays. Lift-Off Top Shipping Cases are uniquely designed for convenience. The lids are completely removable for ease of packing and storing large items.

Designed for rough handling, removable lids and sturdy bottom shells are constructed of high-density polyethylene. When dropped, this rugged material can absorb some of the energy before it's transferred to the contents. This accessible style meets Air Transport Association of America specification 300 but is only watertight, not waterproof. A rubber gasket in the lid valance seals out dust and moisture.

All cases have four extra-large military-style quarter-turn latches for securing the lid to the bottom. Other features include two padlock loops for security and steel spring-loaded handles. You also get stainless steel lid stays,



extra strong male/female closures. The clear anodized hardware resists corrosion. These attractive containers have an easy-to-clean permanent white finish that's impervious to solvents. All of our lift-off top case models can be easily padlocked. User

installable caster kits also may be added for \$70 per set.

Choose from two foam packages for extra shock absorption. Foam-lined cases contain 2 inches of foam on all sides. Full-foam cases are completely filled with layered 2-inch foam. A small knife is included so you can custom cut the layers to suit your equipment. Assorted shipping decals are also included. Choose from nine sizes to accommodate large items. One-year warranty against manufacturing defects only. *Shipped surface freight only.* The four models that have lids and bottoms shipped in two separate cartons cannot be shipped together because of their assembled size.

Lift-Off Lid Style	2" Lined Foam					Full Foam Filled				
	Case Part #	Ship Wt.	Price 1	Price 2-5*	Case Dimensions (ID)	Case Part #	Ship Wt.	Price 1	Price 2-5*	
	282X504	30	\$324.00	\$307.00	20 x 20 x (12 + 12)	282X506	33	\$342.00	\$325.00	
	282X544	31	315.00	299.00	22 x 22 x (10½ + 10½)	282X546	36	351.00	333.00	
	282X264	36	324.00	308.00	23 x 18 x (14 + 14)	282X266	43	414.00	393.00	
	282X574	42	351.00	333.00	24 x 24 x (15 + 15) Shipped in two separate cartons	282X576	51	432.00	410.00	
	282X614	41	359.00	341.00	26 x 26 x (13 + 13) Shipped in two separate cartons	282X616	54	450.00	427.00	
	282X304	55	414.00	393.00	34 x 25 x (13 + 13) Shipped in two separate cartons	282X306	70	486.00	461.00	
	282X334	35	333.00	316.00	35 x 18 x (10 + 10)	282X336	47	396.00	376.00	
	282X354	47	351.00	333.00	37 x 22 x (14 + 14) Shipped in two separate cartons	282X356	64	441.00	419.00	
	282X364	44	342.00	325.00	38 x 22 x (10 + 10)	282X366	56	432.00	410.00	

* For 6-up prices, call for quote.



Low-Cost Make-Your-Own Cases

Here's the perfect blow-molded solution to your needs for attractive, low-cost custom cases. They are manufactured from high-density polyethylene with double-wall construction. Each case features a mechanical hinge system made to last through thousands of openings and closings. Egg crate foam fills the lid interior while pre-cut cubed foam in the body lets you make a custom fit for the contents. The textured exterior resists dents, cracking and scuffs. It is unaffected by temperatures from -70 F to +180 F. These cases meet U.S. 94B Specifications as electrical insulators and are impervious to chemicals. Choose from seven sizes in black, each with a one-year warranty.

Stock Number	Inside Dimensions	Wgt.	Prices	
			1-5	6-up
073X317	7.5" x 5" x 2.125"	2	\$12.00	\$10.75
073X323	9.5" x 6" x 2.625"	2	15.00	13.50
073X327	11" x 7" x 3.375"	3	22.00	19.75
073X330	12.5" x 9" x 5.125"	3	29.50	26.50
073X333	14" x 10" x 4"	4	36.50	33.00
073X337	16" x 11" x 2.875"	4	35.00	31.50
073X355	17.75" x 12.75" x 6.625"	7	71.00	64.00



Deluxe Poly Foam Cases

We have the heavy-duty alternative for instrument and display-type cases. Extra-durable polyethylene material is beautiful and can withstand the roughest treatment. Combination locks and presto-type, chrome-plated latches make these cases ideal for carrying or transporting delicate equipment or expensive instruments. Polyethylene cases are supplied with diced foam to allow a custom fit for contents. Layered foam comes in the 730 Jumbo Case. Black with silver hardware in four sizes. The 10-pound standard is 18.25" x 13" x 8.5" (inside dimensions). Our 12-pound large is 20.75" x 16" x 9.5" (ID). The 19-pound extra large is 25" x 19" x 12" (ID). Our 31-pound jumbo is 29.5" x 23.75" x 16" (ID). One-year warranty.

082X718	718 Standard Case	1-5, \$112.00 ea.; 6-up, \$104.00 ea.
082X721	721 Large Case	1-5, 156.00 ea.; 6-up, 140.00 ea.
082X725	725 Extra-Large Case	1-5, 190.00 ea.; 6-up, 172.00 ea.
082X730	730 Jumbo Case	1-5, 275.00 ea.; 6-up, 255.00 ea.





Standard Molded Series

The industry's most popular cases! Platt has designed these molded cases expressly to solve the problem of how to safely transport and attractively display a wide variety of electronic equipment, instruments and other delicate items. Heavy-duty, scuff-resistant, molded ABS thermoplastic forms the tough shell of these cases. An extruded aluminum rim, drawbolt key locks and a strong molded steel core handle assure long years of service. The interior is filled with three-piece polyether foam with the bottom foam pre-cut into removable cubes (diced) to allow a tight custom fit for whatever is being transported. The top is filled with convoluted or egg crate type foam. These cases are black in color, come in a variety of sizes and will securely house and protect any number of products.

Stock No.	Part No.	Inside Dimensions	Prices	
			1-5	6-24
073X410	1410	10" x 7" x 5"	\$45.00	\$40.50
073X412	1412	12" x 9" x 5"	50.00	45.00
073X414	1414	12" x 11" x 5"	56.00	50.50
073X416	1416	16" x 12" x 5"	60.00	54.00
073X426	1426	16" x 12" x 7"	66.00	59.50
073X419	1419	19" x 13" x 5"	75.00	67.50
073X424	1425	19" x 13" x 7"	81.50	73.50

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Heavy-Duty Molded Series

This series of cases from Platt is similar to the 1400 series in construction but is available in either a special, leather grained ABS or polyethylene thermoplastic construction for an even more durable and attractive design. These cases feature a modern squared-corner design, leather grained shell and deluxe hardware package that includes golf grip handle and cast chrome key locks. The interior is filled with three-piece polyether foam with the bottom foam pre-cut into removable cubes (diced) for a tight make-your-own fit. The top is filled with convoluted or egg crate type foam to cushion whatever is being carried inside securely. We offer five sizes of ABS molded cases and five sizes of polyethylene shell cases including the new 28" extra large size! Both versions are black in color.



Stock No.	Part No.	Case Type	Inside Dimensions	Prices	
				1-5	6-24
073X432	1705	ABS	17" x 11" x 5"	\$ 83.50	\$ 75.00
073X434	2005	ABS	20" x 14" x 5"	92.00	83.00
073X440	2207	ABS	22" x 16" x 7"	118.00	106.00
073X443	2407	ABS	25" x 19" x 8"	138.00	124.00
073X445	2807	ABS	28" x 20" x 7"	172.00	155.00

Stock No.	Part No.	Case Type	Inside Dimensions	Prices	
				1-5	6-24
073X507	120907	Poly	12" x 9" x 7"	\$108.00	\$ 97.00
073X515	201407	Poly	20" x 14" x 7"	130.00	117.00
073X526	221609	Poly	22" x 16" x 9"	158.00	142.00
073X533	241809	Poly	24" x 18" x 9"	172.00	155.00
073X544	282009	Poly	28" x 20" x 9"	206.00	185.00





Tuff-Light Padded Carrying Cases

Protect your expensive equipment from the abuse of carrying it to and from the jobsite. Our all new, Tuff-Light padded zipper cases are designed to accommodate most popular sizes of test equipment, instruments, scopes and computer hardware. These are industrial-quality cases built to demanding specifications using only top-grade materials. Each case features three-wall construction. It begins with a tough nylon liner that forms the inside wall of the case plus a full 1/2 inch of ester-type foam that forms the inner layer and finally an exterior cover of the puncture-resistant and water-repellent Cordura material that has long been recognized as the most durable of all cloth-type materials. Additional features include heavy-duty adjustable, nylon web shoulder strap, non-corrosive hardware and shoulder pad. These Tuff-Light cases also have heavy-duty nylon web handles with padded leather wrap and snap closures.

We supply these cases in two basic styles. Style A cases are top-opening that sometimes allows test equipment to be used without removing the case. B style cases open in half much like traditional cases, allowing easy access for removing whatever equipment is being carried. Choose from three sizes of A cases and two sizes of B cases to accommodate most every requirement. Both case styles are high-tech blue in color and have convenient interior storage pockets for cables, manuals and other accessories.

B Style Cases

081X346 346 Case (12" x 14" x 5").....1-5, **\$84.00 ea.**; 6-24, **\$75.50 ea.**
081X348 348 Case (20" x 16" x 9").....1-5, **98.50 ea.**; 6-24, **89.00 ea.**

A Style Cases

081X340 340 Case (13" x 17" x 9").....1-5, **\$108.00 ea.**; 6-24, **\$97.00 ea.**
081X342 342 Case (18" x 14" x 6.5") ..1-5, **100.00 ea.**; 6-24, **90.00 ea.**
081X344 344 Case (8.5" x 12" x 5")1-5, **83.50 ea.**; 6-24, **75.00 ea.**

Anti-Static Circuit Board Cases

These PCB-Series cases are made of a very attractive and lightweight (static-free) cotton duck material with RCAS® 1200 anti-static end shells. Inside, circuit boards are further protected from damage and degradation in a compact, static-free cushioned environment. Each case incorporates both RCAS® 1200 and Cancel® static-free cushioning materials that meet or exceed military specifications MIL-B-816605, Type II and PPP-C-1842A, Type III.

And these cases are extremely versatile. Each interior features adjustable separators that make carrying a number of pcbs of varying sizes possible. The exterior of each case features two easy-access pockets that are handy for carrying wrist straps, manuals and other workservice materials. Additional features include the golf grip handle and two safety key locks. Choose from five popular sizes. Model 12-PCB, measuring 12" x 12" x 8", is designed for carrying short boards commonly used in the telephone industry. The 18-PCB case is 21" x 16" x 5", Model 21-PCB measures 21" x 12" x 8", the 29-PCB case is 23" x 18" x 8", and Model 24-PCB measures 17" x 14" x 13".

073X290 12-PCB Circuit Board Case..1-5, **\$158.00 ea.**; 6-24, **\$143.00 ea.**
073X295 18-PCB Circuit Board Case..1-5, **184.00 ea.**; 6-24, **166.00 ea.**
073X300 21-PCB Circuit Board Case..1-5, **202.00 ea.**; 6-24, **182.00 ea.**
073X310 29-PCB Circuit Board Case..1-5, **244.00 ea.**; 6-24, **220.00 ea.**
073X305 24-PCB Circuit Board Case..1-5, **261.00 ea.**; 6-24, **235.00 ea.**



21" Standard



21" Deluxe



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Standard Catalog Cases

Platt's Standard Catalog Cases are among the finest looking ones made. They are lightweight yet strong. Their patented construction features nylon-backed vinyl tops and sides plus extra-strong thermoplastic shells on both ends. Concealed metal rods running the length of the case are riveted to the end shells. This light yet flexible frame supports extra weight without damaging the case. Includes large bottom studs for support, handy outside pocket, chrome-plated combination locks and comfortable golf-grip handle. Choose from two sizes in Oxford brown and black. The 7-pound HT219 brown and HT319 black cases are 19" x 12" x 8" (ID). The 8-pound HT221 brown and HT321 black cases are 21" x 12" x 8" (ID). One-year warranty.

073X817 HT219 19" Brown Case.....1-5, **\$79.00 ea.**; 6-up, **\$71.00 ea.**
073X830 HT319 19" Black Case1-5, **79.00 ea.**; 6-up, **71.00 ea.**
073X820 HT221 21" Brown Case.....1-5, **87.00 ea.**; 6-up, **78.50 ea.**
073X835 HT321 21" Black Case1-5, **87.00 ea.**; 6-up, **78.50 ea.**

Deluxe Catalog Cases

Top-of-the-line Deluxe Catalog Cases from Platt share all the features of the Standard Catalog Cases. Aluminum frames around the outside of the thermoplastic end shells are a deluxe added feature. These frames with reinforced corners provide maximum durability and longest wear. Choose from two sizes in Oxford brown. The 7-pound HT219I is 19" x 12" x 8" (ID); the 8-pound HT221I is 21" x 12" x 8" (ID). One-year warranty.

073X819 HT219-I 19" Case.....1-5, **\$101.00 ea.**; 6-up, **\$91.00 ea.**
073X821 HT221-I 21" Case.....1-5, **111.00 ea.**; 6-up, **100.00 ea.**



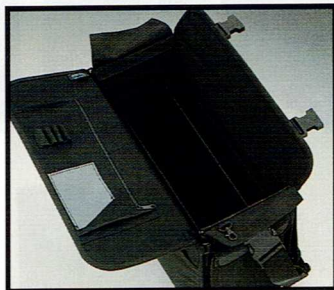
Ultima Catalog Case

The Ultima Catalog Case provides durable construction for catalog protection with extra storage yet it is light weight for portability. A drop-down feature at the top allows for Ultima convenience and ease of access. On the inside, you get spacious catalog storage with partition plus key chain holder and zipper pouch for pencils, business cards and other small items. The outside has four custom pockets for storing additional items.

The weather- and stain-resistant exterior is 1000 Denier Cordura® Plus for durability and long life. The stylish ribbed wear-resistant material in the bottom provides shape and rigidity. As a bonus, you get combination locks and a removable 2-inch heavy-duty shoulder strap for carrying convenience. This 6-pound black case is 18" x 7.5" x 13". One-year warranty.

H1911SPC 18" Ultima Case

081X1081-5, \$145.00 ea.; 6-24, \$130.00 ea.



SPC Ultima VIII Computer Case

This soft-sided case holds a laptop computer along with other necessary business materials. The Ultima VIII features two outside flap pockets. One flap contains zippered pockets for miscellaneous items such as sunglasses. The other pocket provides for quick and easy access to airline tickets and other small items. A window pocket allows for insertion of business or employee identification card.

The interior is smartly lined with a wear-resistant tribute lining. Inside you will find two spacious zipper compartments. One is padded to protect a notebook computer and other small items such as a cellular phone. The briefcase side contains a file folder pocket with a set of flat pockets for business cards and other small items. Includes pen and pencil loops plus key storage snap. Specially designed end pockets hold extra writing instruments and awkward items.

Made in the U.S.A., the weather- and stain-resistant exterior is 1000 Denier Cordura® Plus for durability and long life. Dual zipper pulls offer ULTIMA convenience. Five bumpers at the bottom of the case provide stability and protection.

This 6-pound black case measures 16" (L) x 11.5" (H) with the width divided into two 3.25" compartments. One-year warranty.

G1841SPC Ultima VIII Case

081X1001-5, \$127.00 ea.; 6-24, \$115.00 ea.

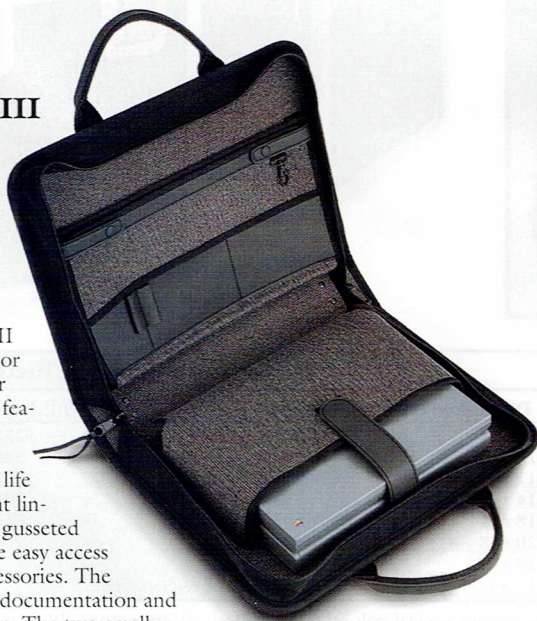


SPC Ultima III Notebook Computer Case

Protection and convenience can be both compact and lightweight. The soft-sided Ultima III case holds a laptop or notebook computer and much more. It features a Cordura® Plus exterior for durability and long life with a wear-resistant lining. Three exterior gusseted flap pockets provide easy access to supplies and accessories. The large pocket stores documentation and portable office items. The two small pockets are designed for computer accessories, power cords, cables, mouse and even a small printer.

An interior zipper compartment features a briefcase side with two spacious file folders. It includes pockets for 3.5-inch disks, pen/pencil loops, key storage snap and a business card holder. The other side features a large 12.25" x 7.5" x 1" foam-padded pocket to protect a notebook computer. A removable shoulder strap with a contoured shoulder pad is included. This 5-pound black case measures 15" x 11" x 3". One-year warranty.

081X103 Ultima III Case1-5, \$70.00 ea.; 6-24, \$63.00 ea.

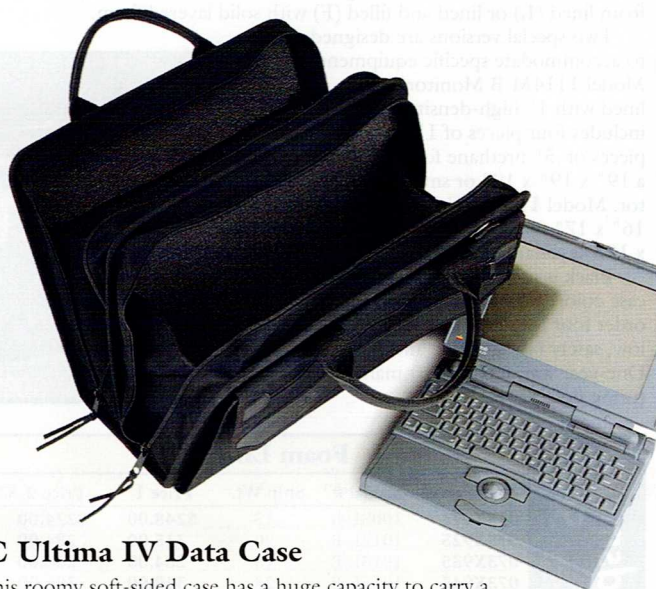


SPC Ultima IV Data Case

This roomy soft-sided case has a huge capacity to carry a portable laptop or large notebook style computer plus accessories. The Cordura® Plus exterior assures long life and durability. It features three gusseted flap pockets with an identification/business card pouch. The large pocket stores documentation and portable office items. Two small pockets are designed for computer accessories, power cords, cables, mouse and even a small printer.

The two spacious inside zippered compartments with side pockets provide ample storage. One holds a notebook computer. The other has two briefcase file folders for literature and accessories plus organized storage of 3.5" diskettes, calculator, pen/pencil loops, key storage snap and business card holder. A removable shoulder strap with shoulder pad is included. This 7-pound black case is 17.25" x 13" x (3.25" x 3.25"). The Ultima IV fits in airline overhead compartments and under seat storage. One-year warranty.

081X104 Ultima IV Case.....1-5, \$132.00 ea.; 6-24, \$119.00 ea.





In addition to the standard black color, Platt ATA Cases may be custom ordered in four other special colors: safety yellow, safety orange, blue and gray. Call our Sales Department at (800) 866-5353 for more information.

Guardsman® ATA 300

Shipping Cases

Tough Reusable Containers

- Strong yet lightweight
- Continuous industrial frame
- Foam lined or foam filled in five colors

Heavy-duty construction features HMW polyethylene thermoplastic sheets bent to size to form strong but lightweight containers. Cases are ideal for shipping computer, video, audio, medical, electronic instrumentation and industrial equipment. All cases use unique continuous industrial frame construction for maximum strength and durability. Hardware is recessed for wearability and shipping ease. Each model includes piano hinge, combination lock, security-type bolts and spring-loaded handle.

All top and body case interiors are lined with high-density foam. Dimensions are taken inside foam lining. Choose from six models in your choice of foam lined (L) or lined and filled (F) with solid layered foam.

Two special versions are designed to accommodate specific equipment. Model 1114M-B Monitor Case is lined with 1" high-density foam and includes four pieces of 1" and four pieces of .5" urethane foam. It will fit a 19" x 19" x 19" or smaller monitor. Model 1116CPU-B has a 6.5" x 16" x 17" foam cavity with a 2" x 7" x 19" keyboard cavity.

Black is the standard Guardsman® case color. Also you may custom order four special colors: safety yellow, safety orange, blue and gray. One-year warranty against manufacturing defects.



platt

Guardsman®
Style

Foam Lined

Case Part #	Model #	Ship Wt.	Price 1	Price 2-5*	Case Dimensions (ID)
073X915	1008L-B	13	\$248.00	\$224.00	12 x 9 x (11.5 + 3)
073X925	1012L-B	20	315.00	284.00	16 x 10 x (12 + 5)
073X935	1013L-B	15	284.00	256.00	18 x 11 x (6 + 3)
073X945	1016L-B	23	340.00	306.00	20 x 14 x (9 + 4)
073X955	1018L-B	35	408.00	368.00	26 x 18 x (14 + 4)
073X965	1112L-B	61	614.00	553.00	32 x 20 x (8 + 4)
073X970	1114M-B	30	452.00	407.00	19 x 19 x 19
073X975	1116CPU-B	26	554.00	499.00	20 x 12.5 x 24

Foam Filled

Case Part #	Model #	Ship Wt.	Price 1	Price 2-5*
073X910	1008F-B	16	\$271.00	\$244.00
073X920	1012F-B	21	345.00	311.00
073X930	1013F-B	17	303.00	273.00
073X940	1016F-B	25	388.00	350.00
073X950	1018F-B	39	563.00	507.00
073X960	1112F-B	65	708.00	638.00

* For 6-up prices, call for quote.

All cases come standard in black (-B). Custom order four other special colors: safety yellow, safety orange, blue and gray.



Specify Surface Freight Only

Don't be confused by our (surface freight) only classification on these products. Designed and built to ATA specifications for air or sea transport, these cases are excluded from our \$14.95 overnight delivery offer because of their price-to-weight ratio. Normally we ship them via UPS or common carrier, but we will gladly ship them by any specified method within 24 hours of receiving your order. (Figure on \$1.50-\$2.00 per pound for overnight air shipment.) Call the SPC Sales Department at (800) 866-5353 for specific information.

NEXT-DAY DELIVERY
ONLY \$14.95!



Deluxe Plastic Tool Cabinets

Conveniently pack repair parts and spares in portable cabinets that are as much at home on the go as on the bench. Uniquely designed to organize, store and protect precision tools, hardware and small parts, attractive Flambeau cabinets are indispensable on the service bench, in the R and D lab and even in vehicles! Industrial-grade, high-quality cabinets are molded from tough ABS plastic. They are constructed of all rust-proof materials and resist oil, chemicals and common solvents. Each has a self-storing front door panel with a padlock tab for security, twin latches, shock-absorbing non-slip feet and luggage handle. Attractive brown and tan cabinets with distinctly visible orange drawers are 19.5" x 10.4" x 15". Three models offer differing drawer configurations. Guaranteed against manufacturing defects.

Model 2275-2 has five drawers. Three drawer configurations accommodate the largest parts of the three models. Four drawers are 1.4" deep (two 840s and two 841s). The fifth is 4.5" deep (928). Weighs 18.3 pounds.

466X260 Model 2275-2.....1-5, \$114.00 ea.; 6-up, \$105.00 ea.

Model 2276-2 is the six-drawer model. Four drawer configurations offer the widest storage variety. Five are 1.4" deep (one 840, three 841s and one 839). The sixth is 2.9" deep (869). Weighs 18.6 pounds.

466X270 Model 2276-2.....1-5, \$114.00 ea.; 6-up, \$105.00 ea.

Model 2277-2 is the seven-drawer style. Three different drawer configurations are useful for storing and stocking small parts. Each drawer is 1.4" deep (four 480s, two 841s and one 839). Weighs 20 pounds.

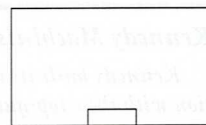
466X280 Model 2277-2.....1-5, \$114.00 ea.; 6-up, \$105.00 ea.



AR840-32 (2 ea.)



AR841-32 (2 ea.)



AR928-32 (1 ea.)

Satchel-Style Cases

Store and carry literature, samples, small tools or parts in handsome Flambeau satchel-style cases. Molded from rugged copolymer resins for rustproof, odor- and oil-resistant finish, they are built to last. Includes comfortable strap handles retained by rust-proof metal hardware, double draw bolt latches, pinned hinges and tongue-and-groove gray-tinted covers. Four 15" x 11.75" x 2.5" styles for unlimited applications. Guaranteed against manufacturing defects.

Model 711-2 is a large open case with storage flexibility. Its compartment without dividers is ideal for literature or samples. Weighs 2 pounds.

Model 711-2 (Single Compartment)

466X1201-5, \$18.00 ea.; 6-up, \$15.50 ea.

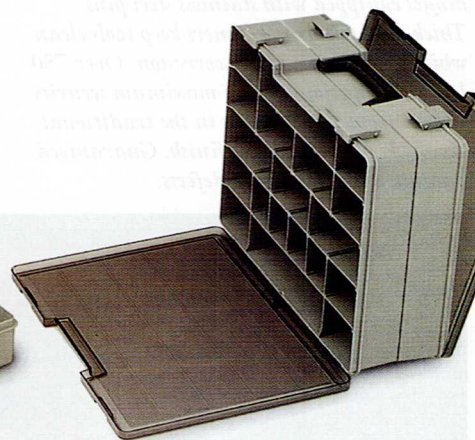
Model 724-2 offers a quality package for small parts, tools or samples in virtually every area of sales, repair and service. Customize 15 removable dividers for nine to 24 compartments. Weighs 3 pounds.

Model 724-2 (Adjustable Compartments)

466X1221-5, \$20.00 ea.; 6-up, \$17.00 ea.

Model 725-2 is our most popular case. Back-to-back 711-2 single-compartment and 724-2 adjustable divider boxes are sonically welded together for strength. Carry literature on one side and repair parts or samples on the other. Weighs 4 pounds.

466X125 Model 725-2 (Two-Sided Case) ..1-5, \$38.00 ea.; 6-up, \$32.50 ea.



Flambeau

Model 748-2 is a two-sided case. Two 724-2 adjustable divider boxes are sonically welded together to create a very versatile case. Depending on desired configuration, nine to 24 compartments per side offer optimum storage and transporting capabilities. Weighs 5 pounds.

466X128 Model 748-2 (Two-Sided Case) ..1-5, \$40.00 ea.; 6-up, \$34.00 ea.

Polypropylene Boxes

Organize and carry small items for mechanics, plumbers and electricians. Extremely durable opaque yellow polypropylene boxes are molded with heavy-duty, heat-sealed hinges. They resist most common solvents and chemicals. Guaranteed against manufacturing defects.

Models M824 and M806 measure 9" x 13.2" x 2.4". M824 is divided into 24 equal compartments and weighs 2 pounds. M806 has six compartments and weighs 2 pounds.

466X698 Model M824.....1-23, \$10.00 ea.; 24-up, \$8.50 ea.

466X687 Model M806.....1-23, 9.00 ea.; 24-up, 7.65 ea.

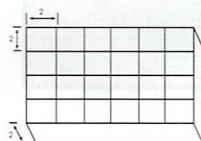
Models M203 and M200 measure 4.5" x 8.25" x 1.4". M203 has six compartments and weighs .3 pounds. M200 is divided into 18 equal compartments and weighs .4 pounds.

466X653 Model M203.....1-23, \$3.00 ea.; 24-up, \$2.50 ea.

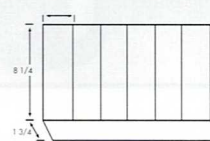
466X650 Model M200.....1-23, 3.00 ea.; 24-up, 2.50 ea.

Model M623 provides storage versatility in a 6.75" x 11" x 1.75" box. It has 13 compartments in three different sizes. Weighs 1 pound.

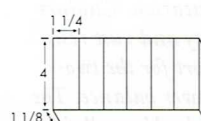
466X676 Model M623.....1-23, \$5.50 ea.; 24-up, \$4.70 ea.



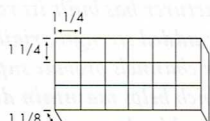
M824



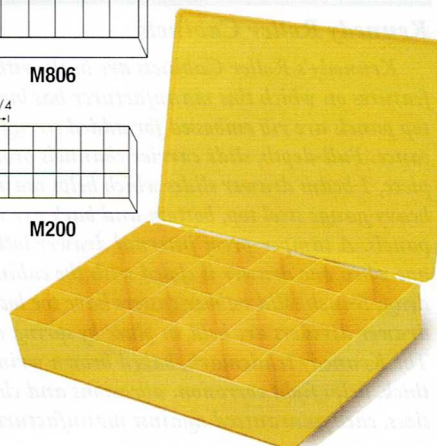
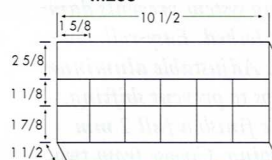
M806

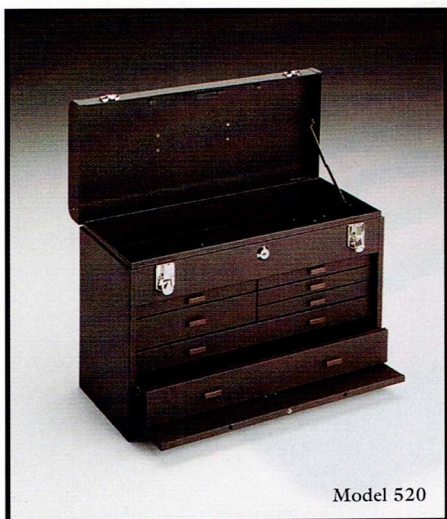


M203



M200





Model 520



Model 526



Model 52611

Kennedy Machinists' Chests

Kennedy built its world-famous reputation with these top-quality machinists' chests. Made to last, they feature double-wall steel side panels, two-piece drawer slides and lid hinges equipped with stainless steel pins. Thick wool felt drawer liners keep tools clean while protecting against corrosion. Over 750 lock combinations ensure maximum security. Choose from three models in the traditional Kennedy brown wrinkle finish. Guaranteed against manufacturing defects.

Model 520 is the first choice of the apprentice. This basic seven-drawer chest has six adjustable drawer dividers. It is 20.2" x 8.6" x 13.7" and weighs 28 pounds. *Shipped surface freight only.*

057X200 520 Tool Chest 1-5, \$157.00 ea.; 6-up, \$144.00 ea.

Model 526 is everything the experienced journeyman will appreciate. It is an eight-drawer chest with rugged side handles and six adjustable drawer dividers. The 526 measures 26.7" x 8.6" x 13.7" and weighs 36 pounds. *Shipped surface freight only.*

057X210 526 Tool Chest 1-5, \$196.00 ea.; 6-up, \$180.00 ea.

Model 52611 is our largest machinists' chest with 11 drawers. It features nine adjustable drawer dividers and rugged side handles. The 52611 is 26.7" x 8.6" x 8" and weighs 50 pounds. This makes a perfect top chest for either of the roller cabinets described below. *Shipped surface freight only.*

057X850 52611 Tool Chest 1-5, \$248.00 ea.; 6-up, \$228.00 ea.



Kennedy Roller Cabinets

Kennedy's Roller Cabinets are built with all the standard quality features on which this manufacturer has built its reputation. Cabinet top panels are rib embossed for added strength, rigidity and rust resistance. Full-depth, slide carrier channels provide support for the two-piece, I-beam drawer slides which helps maintain drawer balance. The heavy-gauge steel top, bottom and back are welded to double-wall side panels. A tamper-proof internal drawer locking system prevents damage when one drawer is closed with the cabinet locked. Easy-roll, low-drag, 5-inch solid rubber casters have toe locks. Adjustable aluminum drawer dividers are held in place by spring clips to prevent shifting. The Kennedy trademark, baked brown wrinkle finish a full 2 mm thick, helps fight corrosion, abrasions and chipping. Choose from two sizes, each guaranteed against manufacturing defects.



Model 275 is just the roller cabinet for those who want the benefits of compact size without sacrificing hefty storage capacity. This five-drawer model features a swing-down panel to conceal and secure the spacious storage compartment. It comes with heavy-duty casters, four aluminum drawer dividers, side handle, cylinder lock and two keys. The 275 measures 27" x 18" x 35.25" and weighs 114 pounds. *Shipped surface freight only.*

057X125 275 Standard Cabinet 1-5, \$383.00 ea.; 6-up, \$352.00 ea.

Model 378 is perfect for those who need both workbench height and loads of lockable storage space in a deluxe roller cabinet. Because of the storage provided by its eight-drawer design, this cabinet has become our best-seller and an industry favorite. It includes heavy-duty casters, four aluminum drawer dividers, cylinder lock and two keys. Model 378 measures 27" x 18" x 39.25" and weighs 147 pounds. *Shipped surface freight only.*

057X170 378 Deluxe Cabinet 1-5, \$508.00 ea.; 6-up, \$467.00 ea.





Kennedy

Shipped Surface
Freight Only



Cleanroom Pre-Configured Roller Cabinets

Mobile Storage for Contamination-Free Environments

- Choose stainless steel or painted steel for dust-free usage
- Five- and seven-drawer configurations in two finishes
- Sturdy storage with 125-pound drawer capacity

When preventing dust from contaminating cleanroom environments is vital, choose Kennedy cabinets. They securely store tools, components and supplies with the convenience of mobile work stations. Two versions are designed for cleanroom quality where stainless steel surfaces are recommended or smooth painted surfaces are acceptable. When proper cleanroom protocol is practiced, these smooth surfaces will remain clean and dust free.

Select from five- and seven-drawer configurations. Each stainless steel cabinet features 304 stainless body and drawers with #4 brushed finish. Painted cabinets feature 18- and 16-gauge steel body construction and 18-gauge steel drawers with off-white powder-coated polyester painted finish.

All models share many features including 125-pound drawer capacity. Three-member, greaseless full ball bearing Delrin® drawer slides have four levels of ball bearings for effortless, featherlight movement even when drawers are fully loaded. Self-cleaning bridged retainers prevent dust particles

from building up and keep drawers operating smoothly for years. The 5 x 1.5" non-marking polyurethane ball bearing casters have dust and grease seals to prevent contamination. Bearings are double race ball in swivel and trouble-free Delrin® in wheels. You also get stainless steel drawer pulls, handle and hardware plus tubular key high-security lock and key set.

Choose from two five-drawer cabinets. Model 28085 is stainless steel. The 28075 is off-white painted steel. Each measures 29" W x 20" D x 35" H and weighs 141 pounds. One drawer is 25" W x 18.5" D x 2" H, three are 25" W x 18.5" D x 4" H, and one is 25" W x 18.5" D x 10" H.

Select from two seven-drawer models. The 28087 is stainless steel. Model 28077 is off-white painted steel. Each measures 29" W x 20" D x 35" H and weighs 156 pounds. Three drawers are 25" W x 18.5" D x 2" H, three are 25" W x 18.5" D x 4" H, and one is 25" W x 18.5" D x 6" H.

Dimensions do not include handles but do include casters. All units are shipped in non-static generating bags to prevent contamination. Guaranteed against manufacturer defects. *Shipped surface freight only.*

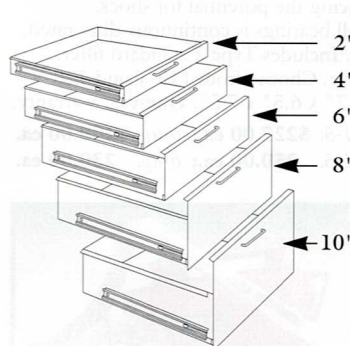
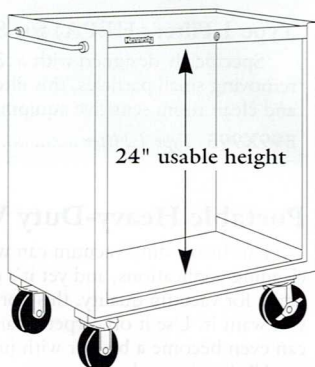
059X085	28085 5-Drawer Steel.....1-5,	\$1713.00 ea.;	6-up,	\$1576.00 ea.
059X075	28075 5-Drawer Painted..1-5,	991.00 ea.;	6-up,	912.00 ea.
059X087	28087 7-Drawer Steel.....1-5,	1984.00 ea.;	6-up,	1826.00 ea.
059X077	28077 7-Drawer Painted..1-5,	1137.00 ea.;	6-up,	1047.00 ea.

Custom-Designed Cabinets

Combine Housing and Drawers

To custom design a cabinet to fit your individual storage needs, order 28980 stainless steel housing or 28970 off-white painted steel housing. Includes handle and casters. Each housing measures 29" W x 20" D x 35" H and weighs 76 pounds. Then specify any combination of stainless steel or off-white painted steel drawers with a total height of 24 inches (usable housing height).

Choose from five drawer sizes: 2" (25" W x 18.5" D x 2" H, 12 pounds), 4" (25" W x 18.5" D x 4" H, 14



pounds), 6" (25" W x 18.5" D x 6" H, 16 pounds), 8" (25" W x 18.5" D x 8" H, 18 pounds) and 10" (25" W x 18.5" D x 10" H, 21 pounds).

The optional 29000 plastic cap is 30" W x 21" D x 2" H and weighs 3.5 pounds. Seamless, ABS white plastic cover fits snugly over cabinet top. A 3/4" raised lip prevents roll offs. Easy-to-clean work surface adds a finished look.

Dimensions do not include handles but do include casters. Shipped in non-static generating bags to prevent contamination. Guaranteed against manufacturer defects.

059X980	28980 Stainless Housing.....1-5,	\$862.00 ea.;	6-up,	\$794.00 ea.
059X802	28802 2" Stainless Drawer...1-5,	150.00 ea.;	6-up,	138.00 ea.
059X804	28804 4" Stainless Drawer...1-5,	166.00 ea.;	6-up,	153.00 ea.
059X806	28806 6" Stainless Drawer...1-5,	179.00 ea.;	6-up,	165.00 ea.
059X808	28808 8" Stainless Drawer...1-5,	193.00 ea.;	6-up,	178.00 ea.
059X810	28810 10" Stainless Drawer...1-5,	206.00 ea.;	6-up,	190.00 ea.
059X970	28970 Painted Housing.....1-5,	\$567.00 ea.;	6-up,	\$524.00 ea.
059X702	28702 2" Painted Drawer.....1-5,	76.00 ea.;	6-up,	70.00 ea.
059X704	28704 4" Painted Drawer.....1-5,	85.00 ea.;	6-up,	79.00 ea.
059X706	28706 6" Painted Drawer.....1-5,	88.00 ea.;	6-up,	81.00 ea.
059X708	28708 8" Painted Drawer.....1-5,	88.00 ea.;	6-up,	81.00 ea.
059X710	28710 10" Painted Drawer.....1-5,	93.00 ea.;	6-up,	86.00 ea.
059X000	29000 Plastic Cap for 29" Cabinet.....1-5,	\$36.00 ea.;	6-up,	\$34.00 ea.



3M

3M Field Service Vac

Designed by 3M Corporation for its own office products service department, this durable, reliable vacuum cleaner set the standard for all others. Designed specifically for cleaning toner from copy machines, it is also great for cleaning printers, floors or just about anything else a field engineer might encounter.

New safety features and technological advancements have been added. Important current limiting features help protect customer engineers from potential electrical power and the annoyance of electrostatic discharge (ESD) plus reduce the risk of shock damage to sensitive electronic components. The heavy-duty case contains a self-storing vacuum hose assembly, wand and crevice tool made with a new plastic that slows down the flow of electricity and drains away static, dramatically reducing the potential for shock.

A 1-hp/5-amp motor with sealed ball bearings is continuous-duty rated, completely self contained and static safe. Includes Type 2 standard filter, dusting brush/adaptor and tubular nozzle. Choose from 115-V and 120-V ac models. Each 9-pound black unit is 17" x 6.5" x 7.5". One-year warranty.

599X990 Model 497-AJM 115-V Vac...1-5, \$227.00 ea.; 6-up, \$209.00 ea.

599X992 Model 497-ABF 220-V Vac...1-5, 250.00 ea.; 6-up, 230.00 ea.

ESD Safe!

Vac-Case

Vac-Case is specifically designed to piggyback the 3M Model 497-AJ Field Service Vacs. It also works great with Atrix's AAA Toner Vacs and Eltrex's Laser Vacs. This accessory case fits snugly over a vacuum which is held securely beneath it with easy-fastening velcro.

Made of durable black Cordura, VacCase features a comfortable padded handle and wide detachable shoulder strap with a rubber pad. This is the easy and efficient way to carry a portable vacuum. In addition, it inexpensively rejuvenates a vac with a damaged case or handle.

The case's large storage compartment measures 4" (D) x 7" (W) x 19" (L). Use it to store cleaning accessories, supplies, tools, toner, circuit boards and replacement parts. The Vac-Case weighs 3 pounds. One-year warranty.

082X805 Vac-Case

1-5, \$59.00 ea.; 6-up, \$49.00 ea.

Replacement Filters for 3M Vacs

Type 2 Filter for Toner and Dust

This is the standard filter included with 3M's Field Service Vac. It is designed for removing toner and dust from vacuums, copiers, laser printers, electronic typewriters and data processing equipment.

599X999 Type 2 Filter\$12.00 ea.

Type 1 Filter (HEPA) for Small Particles

Specifically designed with a .3- to .5-micron concentrated weave for removing small particles, this filter is perfect for use with laser printer toner and clean room sensitive equipment like disk drives.

599X995 Type 1 Filter\$24.00 ea.

Portable Heavy-Duty Vacuum

This heavy-duty vacuum can withstand the most demanding industrial cleaning applications, and yet it's easy to transport. Made by Hoover, the name for vacuum quality, this portable vacuum puts cleaning power where you want it. Use it on carpets, bare floors, shelving and computer printers. It can even become a blower with just the flip of a switch.

All the pictured attachments are included with the vacuum. You get a rug/floor nozzle, wall/floor brush, dusting brush, furniture nozzle, crevice tool and two-piece wand set. It also includes a 35-foot cord, over-the-shoulder carrying strap and 2-quart reusable dust bag. Compact and easy to use, this portable vacuum is small enough to fit on a stair tread and is a favorite of field technicians everywhere. It weighs just 14 pounds and is backed by a one-year warranty.

331X100 S7065-060 Portable Vac.....1-5, \$160.00 ea.; 6-up, \$147.00 ea.

331X050 43662023 Repl. Bag.....1-5, 10.00 ea.; 6-up, 9.00 ea.



NEXT-DAY DELIVERY
ONLY \$14.95!



Data-Vac ElectricDuster

With Micro Cleaning Tool Kit

The compact, hand-held Data-Vac ElectricDuster prevents costly equipment downtime and computer malfunctions. Concentrated air cleans inaccessible areas. Model ED-3MCT quickly and easily blows dust, lint and debris off keyboards, computers, printers, disk drives and FAX machines plus photographic and other high-tech equipment.

This electric-powered air source is far less expensive and safer for the environment than canned air. It costs less than five air refill cans, so it pays for itself in less than two hours of continuous use. A single purchase provides a lifetime of use. The easy-to-operate Data Vac ElectricDuster contains no CFCs, harmful gases or environmentally-destructive propellants which canned air may emit into the atmosphere.



This ElectricDuster weighs only 2 pounds. One-year warranty.

365X230 ED-3MCT ElectricDuster.....1-11, \$51.00 ea.; 12-up, \$46.00 ea.



Data-Vac/1 Pro Series

With Micro Cleaning Tool Kit

Metro Data-Vac is the first fully portable computer vacuum cleaner/blower specially designed and engineered to get into those tight, hard-to-reach spots on your peripherals. Air sweeps paper from your printer and gobbles up dust from disk drives that shut computers down. Just a few minutes of preventative maintenance with MDV-1BA Pro will keep systems running and prevent costly downtime. It makes cleaning computer and office equipment a breeze and is built to take it.

Features black body with black attachments plus rugged all-steel construction, yet it is lightweight. Includes power unit, 19" flexible hose, crevice tool, air pin-pointer, soft bristle dust brush, shoulder strap and five extra reusable/disposable paper bags. The included four-piece Model MCT-4 Micro Cleaning Tool Kit contains tapered adapter, "flex neck" extension wand, micro dusting brush and micro crevice tool. One-year guarantee.

365X240 MDV-1BA Pro Data-Vac/11-5, \$68.00 ea.; 6-up, \$62.00 ea.

365X226 DVP-26 Repl. Paper Bags (5/pkg.)5.00 ea.

365X023 CC-23 Foam-Filled Carrying Case w/ Lift-Out Tray55.00 ea.



Data-Vac/3 Pro Series

With Micro Cleaning Tool Kit

Metro Data-Vac/3BA Pro is the new professional lightweight, high-powered vacuum/blower for maintaining all office equipment. Use it on micros to mainframes, printers, disk drives, calculators, automatic teller machines, electronic cash registers and more. With toner filter system, Model MDV-3BA Pro can be utilized to clean out photocopy machines and laser printers. Simple, preventative maintenance with this Data-Vac is sure to cut costly downtime. Triple filtration system (permanent cloth bag, special disposable toner bag and fiberglass micro filter) keeps the environment clean and contaminant free. Filters particles as small as .3 microns.

Features include powerful 1.7-php motor, exclusive CFM power control and convenient cord storage halo. The sturdy all-steel construction comes in black with black accessories. This total-cleaning package includes dual-purpose portable power unit, 3' flexible hose, two 20" extension wands, "pik-all" nozzle, powerizer air maximizer, crevice tool, soft bristle dusting brush, air pin-pointer, convenient shoulder strap plus two extra disposable toner bags. The included four-piece Model MCT-4 Micro Cleaning Tool Kit contains tapered adapter, "flex neck" extension wand, micro dusting brush and micro crevice tool. Two-year guarantee.

365X280 MDV-3BA Pro Data-Vac/3 ..1-5, \$179.00 ea.; 6-up, \$161.00 ea.

365X210 DV-5PB Std. Replacement Bags (5/pkg.)6.00 ea.

365X290 TBF-7 Repl. Toner Bags (5) and Micro Filters (2).....25.00 ea.

365X023 CC-23 Foam-Filled Carrying Case w/ Lift-Out Tray.....55.00 ea.

Data-Vac/2Pro Series Kit

With Micro Cleaning Tool Kit and Carrying Case

The MDV-2TCA is the professional, lightweight, high-powered vacuum/blower for maintaining all office equipment. Use it on micros to mainframes, printers, disk-drives, calculators, automatic teller machines, electronic cash registers and more. With toner filter system, you can clean out photocopy machines and laser printers. Simple, preventative maintenance cuts costly downtime. Triple-filtration system (permanent cloth bag, special disposable toner bag and fiberglass micro filter) keeps the environment clean and contaminant free. Filters particles as small as .3 microns.

Features include powerful 1.17-php motor, exclusive CFM power control and convenient cord storage halo. Sturdy all-steel construction comes in black body with black accessories. Model MDV-2TCA's total-cleaning package includes dual-purpose portable power unit, cord storage halo, 3' flexible hose, two 20" extension wands, "pik-all" nozzle, powerizer air maximizer, crevice tool, soft bristle dusting brush, air pin-pointer, convenient shoulder strap, two extra disposable toner bags, one extra micro filter and "snorkel" probe all packed in a foam-filled carrying case with lift-out attachment tray. Included four-piece Model MCT-4 Micro Cleaning Tool Kit contains tapered adapter, "flex neck" extension wand, micro dusting brush and micro crevice tool. Model MDV-2BA Pro does not include extra micro filter, "snorkel" probe or carrying case with life-out tray. Two-year guarantee.

MDV-2TCA Pro Data-Vac/2 with Micro Cleaning Tool Kit and Case

365X2771-5, \$204.00 ea.; 6-up, \$184.00 ea.

MDV-2BA Pro Data-Vac/2 Only

365X2501-5, \$141.00 ea.; 6-up, \$127.00 ea.

365X210 DV-5PB Std. Repl. Paper Bags (5/pkg.)6.00 ea.

365X290 TBF-7 Repl. Toner Bags (5) and Micro Filters (2).....25.00 ea.



Radius®

Motorola Two-Way Radios

Radius radios have redefined the term affordability with the professional and reliable portable models that are built and backed by Motorola. With such a trusted name, you know that you'll get a reliable and rugged radio that's fully tested from design to production. The result is a radio with the highest standards in design, quality and performance — a Motorola radio!

These two-way portables can help you increase profits by reducing your operating expenses. By keeping in constant contact with your personnel, you can help them become more productive and efficient, reducing wasted time (and overtime) through better scheduling. With Motorola Radius portable radios, you can handle last-minute details or emergencies — from miles away — with the press of a button.

Demand the best — Motorola!

Commercial Activity FCC Frequency Color Codes

Code	Frequency	Area of Usage	Environment
• Red Dot	VHF 151.6250 MHz	Varying Locations	Line of Site
• Blue Dot	VHF 154.5700 MHz	Constant Location	Line of Site
• Green Dot	VHF 154.6000 MHz	Constant Location	Line of Site
• Purple Dot	VHF 151.9550 MHz	Constant Location	Line of Site
• Brown Dot	UHF 464.5000 MHz	Varying Locations	Urban Areas
• Yellow Dot	UHF 464.5500 MHz	Varying Locations	Urban Areas
★ Silver Star	UHF 467.8500 MHz	Constant Location	Urban Areas
★ Gold Star	UHF 467.8750 MHz	Constant Location	Urban Areas
★ Red Star	UHF 467.9000 MHz	Constant Location	Urban Areas
★ Blue Star	UHF 467.9250 MHz	Constant Location	Urban Areas

Radius Model SP10

Specific Frequency Synthesized Portable Radios

- Dip-switch programmable to 16 frequencies
- Choose VHF or UHF (CSQ or PL)

SPC introduces this new SP10 user-programmable series of synthesized portable radios. Choose from four models: VHF Carrier Squelch (CSQ), VHF Private Line (PL), UHF CSQ and UHF PL. Private Line (PL) provides coded squelch capability for programming a code unique to a specific group of radios. This feature eliminates unwanted transmissions, keeping lines open for important business.

Choose from 1-watt, one-channel VHF models or 2-watt, one-channel UHF models. Each has plenty of power to get your message out loud and clear. The VHF SP10 is factory set to default frequency 154.6000 MHz (green dot) but can be dip-switch programmed to blue, purple, red or 12 other frequencies. Each UHF model is factory set to default frequency 464.5000 MHz (brown dot) but can be dip-switch programmed to yellow, gold, red or 12 other frequencies.

These portables fit comfortably in the palm of your hand or clip easily onto your belt. The attractive, easy-to-use radios measure 5.6" x 2.5" x 1.2" and weigh less than a pound. They come complete with VHF heliflex or UHF whip antenna, ni-cad batteries, belt clip, standard 10-hour ac charging adaptor, owner's/operator's manual and FCC license applications with detailed application instructions. Accessories are optional. Because radios do not have exposed terminals, an HLN9113 Adapter is required to use the HTN9026 Charger. Two-year warranty.

525X800	SP10 VHF CSQ Portable Radio.....	1-5,	\$239.00 ea.;	6-up,	\$227.00 ea.
525X805	SP10 VHF PL Portable Radio.....	1-5,	289.00 ea.;	6-up,	275.00 ea.
525X811	SP10 UHF CSQ Portable Radio.....	1-5,	269.00 ea.;	6-up,	256.00 ea.
525X816	SP10 UHF PL Portable Radio.....	1-5,	319.00 ea.;	6-up,	303.00 ea.

Accessories for the SP10

525X184	HLN8253 Nylon Carrying Case	\$25.00 ea.
525X240	HTN9026 Three-Hour Quick-Rate Charger (HLN9113 Adapter required).....	54.00 ea.
525X228	HLN9113 Charger Adapter (for use with HTN9026 Charger)	15.00 ea.
525X238	HLN9149 Swivel Belt Loop Carry Case Adaptor.....	8.00 ea.
525X183	HLN8252 Leather Carry Case.....	30.00 ea.





SP50 Series Mini Radios

Motorola's Smallest Handheld Models

Motorola's SP50 is designed around one of the most basic elements of portable communications — the hand. Technology and user comfort are combined for reduced size, smooth lines and easily accessible controls in standard and compact portables. Enhanced features make this workhorse one of the most versatile yet cost-efficient two-way radios. Use it for construction, industrial, security and hospitality applications.

For multiple coded squelch capability, choose private line (PL) or digital private line (DPL) with separate PL/DPL code for transmit and receive frequencies of every channel. Receive only calls accompanied by specified radio code, and place calls only to those accepting the code. Monitor control temporarily disables the PL/DPL feature to monitor all activity on a particular channel and check volume level. Option performs one of three functions depending on how your radio is programmed. Channel scan, on 10-channel models only, scans activity on all channels. Tight/loose squelch lets you select additional interference protection in more congested areas. High/low power extends battery life by letting you switch power output levels. TX LED provides solid and flashing red or yellow lights to indicate transmit, low-battery alert, busy channel or monitor. Green flashing OPT LED indicates status of scan, tight/loose squelch or high/low power.

SP50 passes rigorous tests and meets tough military specifications. Lightweight, high-impact housing's O-ring and gasket linings protect electronic circuitry from dirt, dust and moisture. Choose standard (two- and 10-channel VHF and UHF) or compact (two-channel VHF and UHF) models powered by ni-cad batteries. VHF frequency is 150-170 MHz; UHF frequency is 450-470 MHz. Standard version's battery lasts eight-plus hours. The compact model has less battery life in a smaller radio. Each includes VHF Heliflex or UHF whip antenna, 120-V 60-Hz 10-hour desktop charger, 3" spring-action belt clip and manual. The 16.4-ounce standard is 6.2" x 2.5" x 1.28". The 14.4-ounce compact is 5.2" x 2.5" x 1.28". One-year warranty.

Standard Model SP50

VHF Two-Channel/5-Watt (P93YQT20A2_A)	
525X830	1-5, \$475.00 ea.; 6-up, \$452.00 ea.
VHF 10-Channel/5-Watt (P93YQT20G2_A)	
525X835	1-5, \$565.00 ea.; 6-up, \$537.00 ea.
UHF Two-Channel/4-Watt (P94YQT20A2_A)	
525X841	1-5, \$515.00 ea.; 6-up, \$490.00 ea.
UHF 10-Channel/4-Watt (P94YQT20G2_A)	
525X846	1-5, \$605.00 ea.; 6-up, \$575.00 ea.

Compact Model SP50

VHF Two-Channel/5-Watt (P93YQS20A2_A)	
525X820	1-5, \$390.00 ea.; 6-up, \$371.00 ea.
UHF Two-Channel/4-Watt (P94YQS20A2_A)	
525X825	1-5, \$430.00 ea.; 6-up, \$409.00 ea.
525X233 HLN9125 Hard Leather Case, Standard Model	\$35.00 ea.
525X231 HLN9122 Hard Leather Case, Compact Model	35.00 ea.
525X245 HMN9013 Lightweight Headset II w/Swivel Boom Mike	47.00 ea.
525X234 HLN9133 VOX Adapter Kit (for use with HMN9013)	40.00 ea.



Radius®



Radius Model P110

High-Power Programmable Radios

The high-powered P110 is a sophisticated, state-of-the-art portable radio. It incorporates the latest technology available in two-way radio communications. Unsurpassed sound quality saves time and money lost due to muddled messages. Microcomputer technology makes changing operating frequencies and squelch codes economical and fast. The solid frame is designed to handle the use and abuse of your workers, so you won't have to replace it every time it's dropped. Features durable polycarbonate/polyester blended housing.

This synthesized, field-programmable radio has multiple-coded squelch capability. It offers eight private-line/digital private-line codes, one for every transmit and receive frequency. The operator has the privacy of receiving only the calls accompanied by the radio's code and placing calls only to those who accept the code.

All operating controls are on the top of the unit except Push-to-Talk and the control button. Quick-Call II Decoding allows it to be used as an individual or group call pager. It also includes wide band frequency separation, busy channel lock-out, time-out timer plus audible and visual low-battery alerts. The single-unit, 110-volt ac charger with plug-in transformer provides a 16-hour charge rate. These radios are compatible with all GP300 audio accessories and chargers.

Choose the six-channel, 5-watt (146-174 MHz frequency) VHF model or the six-channel, 4-watt (438-470 MHz frequency) UHF model. They come pre-programmed, but you may order a specific custom frequency if desired at no additional charge.

The P110 includes VHF heliflex or UHF flexible whip antenna, rapid charge ni-cad battery, standard rate charger, carry holder with 2.5-inch belt clip and owner's/operating instructions. Accessories are optional. The 18-ounce P110 is 6" x 2.4" x 1.85". One-year warranty.

20/25/30 kHz Channel Spacing

VHF Six-Channel/5-Watt P110 (P43QLC20B2_A)	
525X600	1-5, \$599.00 ea.; 6-up, \$550.00 ea.
UHF Six-Channel/4-Watt P110 (P44QLC20B2_A)	
525X625	1-5, \$660.00 ea.; 6-up, \$607.00 ea.
525X180 HLN8153 Nylon Carrying Case	\$28.00 ea.
525X195 HTN9630 Rapid-Rate Charger	70.00 ea.



Model 1000**Basic, General-Purpose Cart**

This heavy-duty luggage cart is perfect for carrying samples, tool kits, test equipment, office equipment and any other heavy or bulky item. Features chrome-plated steel construction with aluminum extruded handles and heavy-duty wheels for day-in and day-out industrial use.

A strong, 200-pound-capacity cart, Model 1000 is our most economical. This 24-pound cart is 52" x 16.5" x 31" opened but folds to just 25.5" x 19" x 6.5". Collapsing handle design; handles do not telescope. Comes with stretch cords. Lifetime warranty.

379X100 #1000 Cart.....1-5, \$66.00 ea.; 6-up, \$60.00 ea.

**Fold-Flat Cart****Unique Design
Folds to 2.5" Thick**

The convenient Fold-Flat Cart unfolds and is ready to roll in seconds. The large 7.25" cushioned wheels swing out to help your load ride smoothly and safely over curbs and other obstacles. It is the most convenient cart on the road. Use it to carry up to 275 pounds of tools and equipment.

You can store this strong, lightweight, easy-to-use Fold-Flat Cart almost anywhere. Fully extended, the 18-pound cart measures 40" x 19" x 17.5". It folds flat to 26" x 19" x 2.5" for easy, convenient storage. Features fold-down cast-aluminum platform and attached stretch cords. Lifetime warranty.

040X050 11-5781 Fold-Flat Cart1-5, \$149.00 ea.; 6-up, \$135.00 ea.

**Model 2000****Telescoping Cart
with Top Tray**

This is a special version of the original 400-pound-capacity 770. It too is constructed of chrome-plated steel with aluminum extruded handles and heavy-duty wheels. A unique 18" x 20" top tray slides directly on or off a shelf or table without the user actually having to lift the load up to 80 pounds.

The 2000 cart is perfect for demonstration equipment or service/repair facilities. Includes rear wheel assembly for maximum stability and comes with stretch cords. This 30-pound cart measures 52" x 20.5" x 31" fully extended. It folds to 25.5" x 20.5" x 6.5". Telescoping handles. Lifetime warranty.

433X200 #2000 Cart.....1-5, \$271.00 ea.; 6-up, \$250.00 ea.

**Model 770****Standard
Telescoping Cart**

Our most popular cart is convenient and versatile. Made of chrome-plated steel with aluminum extruded handles and heavy-duty wheels. Exceptionally strong with 400-pound capacity, it is very lightweight at only 15 pounds. Open or close the cart easily with one hand by merely squeezing a small bar located just below the handle. This convenient mechanism lets you use the 770 fully extended or at a partially extended height of 37 inches.

Features double-width telescoping handles, large 13" x 16" deck, stretch cords and trouble-free internal locking system. At 52" x 16.5" x 19" fully extended, it collapses to 25.5" x 16.5" x 5.75". Lifetime warranty.

433X077 #770 Cart1-5, \$109.00 ea.; 6-up, \$100.00 ea.

**Tri-Kart 800™ KART-a-BAG®****Professional, Heavy-Duty Telescoping Cart**

The big 300+-pound capacity of this cart makes it suitable for large and extra-heavy loads. All weight is placed on the wheels with no load on your arms, so you just push or pull Tri-Kart 800 for easy transport. Its versatile design allows it to be used as a two- or four-wheel cart. This KART-a-BAG® features unique, patented One-Motion opening and closing. Sturdy, double telescopic self-locking rods provide support for your load. Tri-Kart 800 features sturdy, 6-inch pneumatic rubber rim front wheels, and the 3-inch auxiliary caster wheels are easy for the user to extend and close. Patented design back-support swivel-bearing casters add stability. A Step-Slide feature offers easy access over stairs and curbs. Wheel and mud guards are provided for added protection.

To open this carrier, unhook elastic from cart. Hold the top crossbar and use a single downward motion to drop the cart into its open position. Then push the steel base out from the cart and slide the base lock down. For four-wheel use, pull out the auxiliary casters and secure with sliding lock. Place load on base, stretch elastic cords over load and hook on top handles.

Includes permanently attached elastic cords with adjustable clamp to secure load. With an extended height of 49", Tri-Kart 800 collapses to 20.2". It has a large 12.5" x 16" wheel base and weighs just 17 pounds. Five-year warranty.

435X800 Tri-Kart 8001-5, \$176.00 ea.; 6-up, \$165.00 ea.



Portable Mini Printer

Battery or AC-Operated Printing from Any PC Serial or Parallel Port

Use this high-speed, 40-column impact printer for quality dot matrix printing on single- or dual-ply paper receipts. It provides hard copy results from most RS-232 signal sources. This portable mini printer can be battery or ac powered. Battery operation enables the user to print data at up to 60 cps in the field for 1.5 hours (continuous) on a single charge.

Features surface-mount technology, standard DB-25 connector and built-in 2-k input buffer. Communications capabilities include CTS/RTS and XON/OFF handshaking. Internal switch sets 1200, 2400, 4800 or 9600 baud rate. Standard RS-232 serial interface allows on and off switching from remote computer. It prints standard ASCII characters and dot addressable graphics. At 252 dots per line, it prints 2200 lines per roll at 1.5 lines per second.

Choose from serial and parallel models. Each includes one roll of paper (2.25" wide x 25' long), print ribbon, rechargeable batteries, 117-volt ac adaptor/recharger and manual. Housing measures 3.6" x 4.2" x 2.1" and weighs 13.5 ounces with paper and battery pack. One-year warranty.

Mini Printer III Specifications

Print Speed: 60 cps (1.5 lines per second)
Printer Method: Impact dot matrix
Characters per Line: 40 (20 double width)
Character Size: 1.1 x 2.6 mm
Column Spacing: 1.29 mm
Dots per Line: 252
Character Matrix: 5x7, 5x14, 10x7, 10x14 dots
Line Spacing: 3.78 mm (0.15")
Lines of Print per Roll: 2200
Line Buffering: 2 k
Baud Rate: 1200, 2400, 4800 or 9600 bps
Handshaking: CTS/RTS and XON/XOFF
Ribbon Type: Epson ERC-09 or ERC-22
Print Head Life: 900,000 lines
Connections: Standard DB-25 female



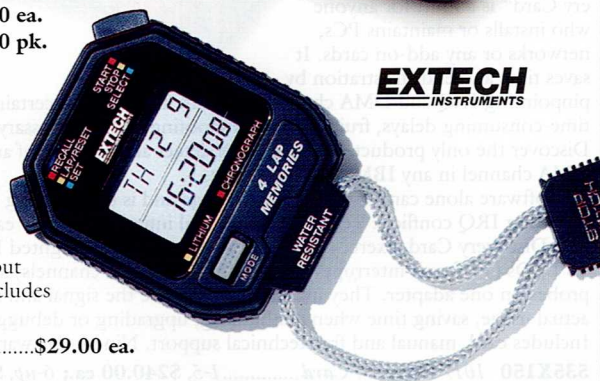
- 160X890** 76818F1-X Mini Serial Printer III1-2, \$399.00 ea.; 3-up, \$368.00 ea.
160X892 77018F1-X Mini Parallel Printer III.....1-2, 399.00 ea.; 3-up, 368.00 ea.
160X830 757058 Repl. Paper (5/pk.)6.00 pk.

Digital Stopwatch

Triple-Function Event Counter

Handsome stopwatch functions as clock, calendar and timer. Super large dual displays count up and down. Timing is accurate to $\frac{1}{100}$ of a second over a range of nine hours, 59 minutes and 59.99 seconds. Built-in memory recalls up to four laps, measurable up to an hour. Clock function features programmable alarm with hourly chime. Built-in calendar tells day, month and date. Display time in 12- or 24-hour intervals. Countdown timer features input ranges from one minute to nine hours, 59 minutes. Auto repeat restarts countdown cycle. Includes 18-inch neck cord and lithium battery. Counter is 2.25" x 3" x .6". One-year warranty.

- 160X055** 365530 Digital Stopwatch\$29.00 ea.



Electronic Counting Scale

Counts and Weighs Small Parts

Accurate, economical Model 160200 Scale displays and stores count and weight data. Three large, bright green fluorescent LED displays indicate weight (five digits), unit weight (five digits) and total count (six digits). Determine quantity and/or weight of components, resistors and other small parts. Weight capacity is 10 pounds with 0.002-pound resolution. Precision load cell sensor meets international OIML standard.

Use tare/zero to store any weight into memory or zero out container weight by readjusting scale to correct zero position after placing empty container on pan. It also provides auto zero tracking. Press CK to set/clear preset number of parts. (Alarm beeps when number is equal to or larger than preset number.) Memory (M+) stores and accumulates count and weight values. Use MC to clear or MR to recall counts, weights and accumulation times. Hold



Scale Specifications

Digital Displays: Weight, unit weight, total count
Weight Capacity: 10 pounds
Resolution: 0.002 pounds
Tare/Zero Function: Readjusts to zero out container weight
SMPL Function: Calculates unknown unit weight and total count
Stainless Steel Pan Dimensions: 11.3" x 9.5"
Precision Load Cell: Meets OIML standard
Power: 110/220 V ac

keeps data from being changed. Input known unit weight from keyboard with UWS. Press CE to clear entry. SMP calculates unknown unit weight and total count.

- Platform holds parts. Powered by 110 or 220 V ac at 50/60 Hz. This 13.5-pound scale is 11.6" x 14.4" x 4.7". One-year warranty.
160X022 160200 Counting Scale1, \$499.00 ea.; 2-up, \$475.00 ea.

Programmable Time Switch

Plug-in Daily/Weekly Timer

Program up to 12 on/off (six on, six off) switchings per day or week. Choose individual days, Monday-Friday, Monday-Saturday, Monday-Sunday or Saturday-Sunday. It is easy to install and operate. The 3-inch tall LCD indicates day, time and program functions. Override interrupts existing program. Specifications include: switching capacity (15 A), reserve power (1.5 V) and power (15-60 Hz; 115 V ac).

A built-in real-time clock has one-year memory and one-year battery backup. Includes three-prong plug and socket for connection. The UL-listed Time Switch measures 2" x 4" x 3". One-year warranty.

- 375475** Time Switch
160X0621-11, \$39.00 ea.; 12-up, \$37.00 ea.



Indoor/Outdoor Temperature Alarm

Audible Alarm Alerts User

Large 1.5-inch LCD indicates indoor and outdoor temperatures to 0.1° F. Wide measuring range is -58° to 158° F. Single-point alarm has external sensor only. Set it to alarm when temperature is above HI SET or below LO SET points. Dual-point alarm has external sensor only. Set it to alarm when temperature is outside of or within two set-points. Audible alarm and red/green LED light for 5 seconds every minute when setpoint(s) reached.

Includes internal temperature sensor, 10-foot weatherproof outdoor sensor with adhesive backing, built-in stand, AAA battery and wall mounting screws. The 3-ounce unit is 2.75" x 2.75". One-year warranty.

- 160X316** 401012 Temperature Alarm...1-11, \$19.00 ea.; 12-up, \$18.00 ea.



The Discovery Card™

Solve Any IRQ or DMA Conflict 100%

This is the first real hardware troubleshooting tool to resolve any Interrupt Request or Direct Memory Access conflict quickly and accurately. The Discovery Card™ is a must for anyone who installs or maintains PCs, networks or any add-on cards. It saves time and ends frustration by pinpointing IRQ and DMA channel conflicts. Eliminate uncertainty, avoid time-consuming delays, fruitless troubleshooting and unnecessary expense. Discover the only product that will 100% detect actual usage of any IRQ or DMA channel in any IBM-PC compatible.

Software alone cannot detect DMA usage and is often wrong when reporting IRQ conflicts. Testing for potential interrupts is now easy. Insert The Discovery Card, exercise your software and read the lighted LEDs. The 18 LEDs (11 for all interrupts and seven for all DMA channels) act as logic probes on one adapter. They immediately capture the signal and report actual usage, saving time when configuring, upgrading or debugging PCs. Includes card, manual and free technical support. Ninety-day warranty.

535X150 1017 Discovery Card.....1-5, \$240.00 ea.; 6-up, \$216.00 ea.

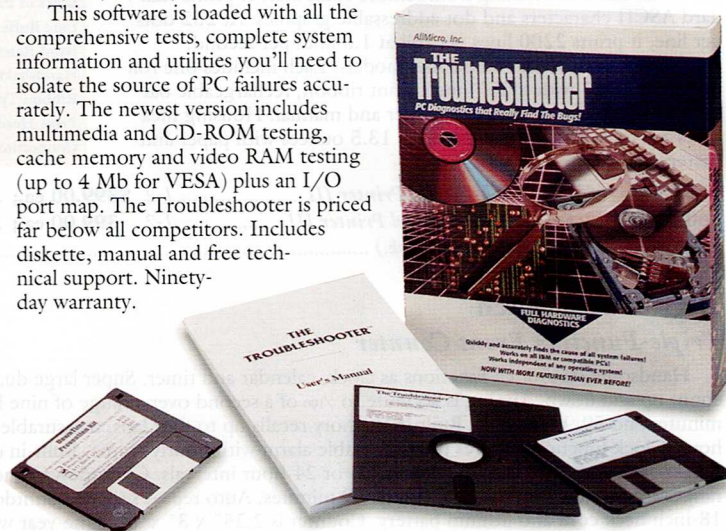


The Troubleshooter™

PC Diagnostics that Really Find the Bugs

The Troubleshooter™ is the most advanced PC diagnostic software available that really finds the bugs. It is unlike other diagnostic programs that rely on DOS. This diagnostic bypasses DOS and tests all major hardware components directly for true accuracy while other programs often give erroneous test results. With The Troubleshooter, you can isolate hardware from operating system problems. Because it's self-booting, The Troubleshooter provides universal application. It runs on most any PC with INTEL or compatible CPU including the new Pentium, regardless of operating system (Novell, Xenix, Unix, OS/2, etc.).

This software is loaded with all the comprehensive tests, complete system information and utilities you'll need to isolate the source of PC failures accurately. The newest version includes multimedia and CD-ROM testing, cache memory and video RAM testing (up to 4 Mb for VESA) plus an I/O port map. The Troubleshooter is priced far below all competitors. Includes diskette, manual and free technical support. Ninety-day warranty.



535X810 1011 The Troubleshooter.....1-5, \$200.00 ea.; 6-up, \$180.00 ea.

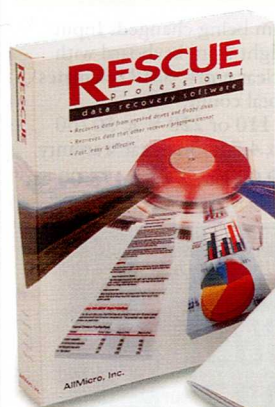
RESCUE Professional™

Data Recovery Software

This is the only program to recover lost data from physically damaged floppies and hard drives easily in as little as 60 seconds even when DOS can't read them. The most advanced data recovery program in the world, RESCUE Professional™ is the fastest, easiest and safest

method anywhere. It runs on most PC, XT, AT 286, 386, 486 and Pentium (with Intel or compatible processor) independent of any operating system.

RESCUE Professional does all the work automatically. No complicated, time-consuming steps. No more manually reconstructing files. This revolutionary software automatically recovers DOS and Windows files including data from compressed drives.



Safely recover text (ASCII), binary, .EXE, graphics files, etc. Select single files by file name or recover entire sub-directories with a single keystroke. Save hundreds, even thousands of dollars by doing your own data recovery. Don't wait until your data is lost. Be prepared for any problem by having RESCUE safeguard your valuable data. Includes diskette, manual and free technical support. Ninety-day warranty.

535X720 1005 Rescue Professional.....1-5, \$200.00 ea.; 6-up, \$180.00 ea.

RESCUE Comparison

Type of Software	RESCUE Professional	RESCUE Retail
Windows NT	✓	✓
Windows 95	✓	✓
DOS	✓	✓
OS2	✓	✓
Lantastic	✓	✓
Netware Light	✓	✓
Bernoulli Drives	✓	✓

RESCUE™ Retail

Data Survival Kit

Recover data from crashed floppies and hard disks in as little as 60 seconds. RESCUE™ Retail is the fastest, easiest, safest data recovery method anywhere. Now you can recover a file even when DOS or Windows cannot read the disk or drive. Use RESCUE with IBM XT/AT, PS/2 or compatibles with a minimum of 384K memory, 600K of free hard disk space, MS-DOS 3.0 or higher and VGA or SVGA.

No more complicated, time-consuming steps. No manual reconstructing files. RESCUE does it all automatically. Recover word processing, spreadsheets, databases, graphics, games, deleted or erased files and compressed drives. Select single files by name or entire subdirectories with a single keystroke. Recover data other programs can't. Prevent lost data, work and time. This revolutionary program is menu-operated with extensive on-line HELP at your fingertips. No technical expertise required. RESCUE provides security and peace of mind by preparing you for any data loss disaster. Includes 3.5" diskette, manual and free technical support. Ninety-day warranty.



535X740 1027 Rescue Retail.....1-5, \$74.00 ea.; 6-up, \$67.00 ea.



LAN Designer™ Software

For Easy, Fast, Inexpensive Network Creation/Installation

- Shortens design time
- Eliminates configuration and compatibility problems
- Eliminates painstaking paper and pencil calculations
- Determines exact hardware requirements

Conquer the problems inherent in LAN design and installation with LAN Designer™. It makes your job easier by putting all the tools you need to design a network at your fingertips. Years of experience from top network design engineers are combined in an easy-to-use format. This tool is designed for consultants, network sales organizations, construction crews, network specialists, MIS managers and VARs. Save time and aggravation by covering all your bases when you review and test your options. With this expert system database, you can avoid the pitfalls common to conventional design techniques. Shorten the design process while increasing accuracy.

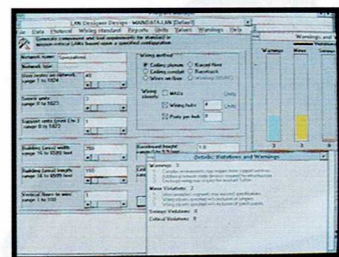
Most in-house LAN builders lack the experience to consider all possible design problems and requirements. This software reminds the designer of the scope of the LAN design and installation. It exposes protocol violations and issues warnings where designs lead to spec violations, installation problems or outstrip site power and cooling. LAN Designer provides reports for bill of materials, installation sequence, installation time estimates, tool requirements, spare parts inventory, site energy and HVAC infrastructure, software recommendations and mission-critical support.

Create an accurate and working design quickly and easily. Design a CAD drawing of a room easily by positioning the server and support units and choosing the number of nodes and wiring layout. Then print the design. The automated network design is a cost-efficient approach to test various physical configurations and provide component and installation cost estimates.

Easily upgrade existing LAN designs. LAN Designer is an effective



AllMicro



method for designing incremental network enhancements to existing LANs. By combining existing data with the database, a Windows user can print to a file. Then use Lotus, Excel or other spreadsheets to compare the two reports and thereby obtain the information to execute the upgrade. This network design software provides file storage and retrieval for configurations, pre-existing LAN design templates, reports to disk and user-configuration expert system databases.

It is Novell, OS/2, Banyan and Windows certified. Supported protocols include Ethernet, FDDI and Token Ring. Supported wiring and protocol variants include STP, UTP, coax, optical fiber, RF and TR. System requirements: Windows 3.0, 3.1, OS/2.1 or OS/2 for Windows, 2 megs of RAM, 1 meg of hard drive space, EGA video or better, monochrome for laptops. Includes diskette, manual and free technical support. Ninety-day warranty.

535X420 1004 LAN Designer1-5, \$220.00 ea.; 6-up, \$198.00 ea.

PC-Technician™ Version 3.50

Professional Level PC Diagnostic System

- High-precision tool for all-around, full-system diagnostics
- Over 200 hardware tests and functions
- User-friendly, menu-driven structure is easy to learn

PC-Technician is a powerful diagnostic tool that is specifically designed to meet the service industry's ever-changing field service needs. First released in 1984, it has been continually enhanced and fine tuned to help the professional service engineer diagnose and repair malfunctioning personal computer systems as quickly, accurately and economically as possible.

This high-precision tool is ideal for local, regional and field service organizations, self-maintainers and PC support professionals. It is the overwhelming choice for all-around, full-system diagnostics after thorough testing in controlled environments using known bad parts. PC-Technician is used by most of the world's largest service organizations needing a diagnostic tool that works and really finds problems.

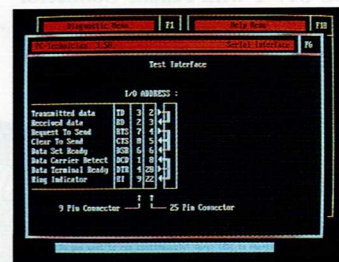
The self-loading proprietary operating system lets it troubleshoot a PC system regardless of its operating system (DOS, Unix, OS/2, etc.). It produces precise, reliable test results that are unaltered by standard operating system error recovery routines. Maximum virus protection is provided. A user-friendly, menu-driven structure makes PC-Technician extremely easy to learn. Service personnel, regardless of experience level, can quickly zero in on the problem and repair or replace only the defective system component.

Written in assembly language, the program is executed quickly and precisely. It uses less than 200 K of main memory when loaded and is capable of program relocation during memory testing. This program utilizes its own custom device drivers so diagnostic routines interact directly with the hardware and do not have the results of various tests altered by the PC's operating system device drivers/error-handling routines.

This system bypasses standard ROM BIOS routines when they fail to provide an exact picture of what is happening with the hardware. IDE and SCSI fixed disk drives go into translation mode to bypass limitations in earlier hardware/software design. This translation mode masks the true infor-



Windsor Technologies, Inc.



mation from the ROM BIOS. For accuracy, PC-Technician's routines access information directly from the controller and fixed disk drive. If this technique is not used, unpredictable or unreliable results can occur.

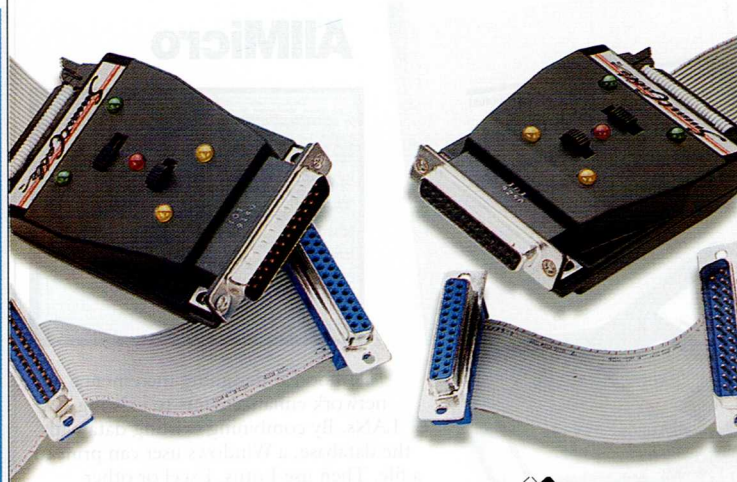
PC-Technician contains over 200 of the most thorough and extensive sets of tests and functions for memory (base, extended and expanded), fixed disk drives (SI506/412, IDE, ESDI and SCSI), diskette drives, video displays and adapters, serial and parallel interfaces plus keyboards. All tests can be run in single pass or continuous mode. Extensive error code information can be logged to the display and the printer.

Multiple diagnostic programs come in a compressed format. Hardware tests and functions primarily focus on the PC's most important, expensive and difficult to diagnose hardware components. Each program is written for a specific microprocessor/bus combination. As it loads, the in-use system combination is analyzed, and the appropriate program is expanded and loaded into main memory. In addition to troubleshooting a malfunctioning PC, PC-Technician can be used to certify a repaired PC, burn in a new PC, edit CMOS, edit the bad track table and low-level format (conditionally or unconditionally) ST506/412, IDE and popular ESDI and SCSI fixed disk drives. PC-Technician supports 8086, 8088, 80286, 80386, i486, Pentium (ISA, EISA, MCA and PCI) and compatible personal computers.

Universal standard capacity 5¼" (360 K) and 3½" (720 K) system diskettes are permanently write-protected (notchless and switchless). Includes set of parallel and serial test plugs plus user handbook in a rugged carrying case for field service use. Thirty-day warranty.

597X100 PC3030 PC-Technician1-5, \$195.00 ea.; 6-up, \$176.00 ea.





Universal Smart Cable

 IQ TECHNOLOGIES, INC.

Instantly Connects Any RS-232-Type Device to Any PC

Smart Cable SC817 is an intelligent serial interface solution that looks at the RS-232 signals from the computer and the peripheral and instantly matches up all the data and handshake control lines automatically! The computer can be any make or model, and the peripheral can be any RS-232 serial device such as a printer, plotter, terminal, modem, bar-code reader, voice digitizer or even another computer — anything.

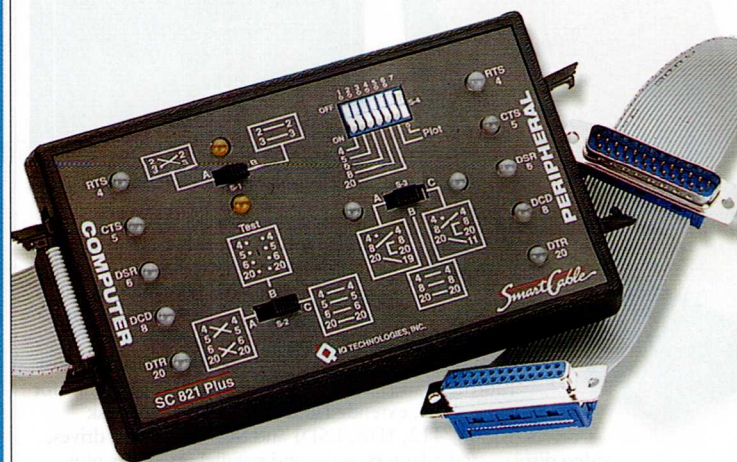
The SC817 is line powered and designed with a double-ended (male and female) DB25 connector on the peripheral side. Choose either a Male (-M) or Female (-F) connector on the computer side. Please specify your choice when ordering.

SC-817-M with Male Connector

456X500 1-5, \$69.00 ea.; 6-up, \$62.50 ea.

SC-817-F with Female Connector

456X450 1-5, \$69.00 ea.; 6-up, \$62.50 ea.



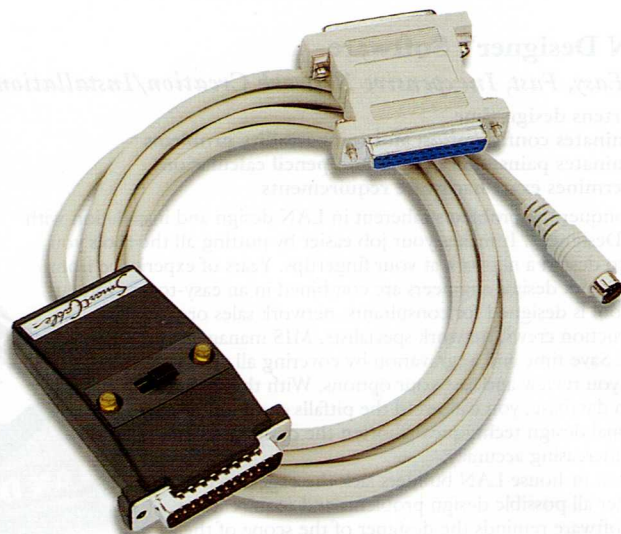
Smart Cable Maker

Graphically Displays Wiring Interface Between Any Two RS-232 Devices

The SC821-Plus is both an intelligent cable plus a diagnostic instrument in one package. It can instantly interface two RS-232 asynchronous serial devices while simultaneously providing a graphic display of the interface connection. By providing breakout box capabilities with easy-to-read LED indicators, debugging the RS-232 interface is simple and very fast. And for non-standard applications, a special DIP switch provides pull-up voltages to the major control and handshake lines.

This line-powered (no batteries) Smart Cable Maker can be left in place indefinitely as a Smart Cable solution, or it can be used to provide the exact wiring information to build a permanent cable. Comes complete with two dual-gender cables so you always have the right connection.

456X550 SC821-Plus 1-5, \$189.00 ea.; 6-up, \$170.00 ea.



Macintosh Smart Cable

Instantly Interfaces Any Non-Apple RS-232 Device to the Macintosh

The new MC600 Smart Cable now makes it possible to connect one or more non-Apple peripherals to your Macintosh quickly and easily — without custom cabling or even knowing the pin-out. Simply plug the eight-pin mini DIN connector into your Mac, plug the male DB-25 connector (female gender changer may be used if necessary) into the serial port on the peripheral device and set the switch. The MC600's patented Smart Cable logic takes care of the rest for you.

Using the patented Smart Cable technology, the MC600 opens up a world of possible hardware and software configurations for your Macintosh. For about the price of a single custom cable, the Macintosh Smart Cable provides a permanent solution to your Mac to RS-232 interface problems.

MC600 Macintosh Smart Cable

456X200 1-5, \$69.00 ea.; 6-up, \$62.50 ea.



 IQ TECHNOLOGIES, INC.

AT/Laptop-Type Smart Cable

Makes Intelligent Connections Between Any AT-Compatible Computer and Peripheral

This is always the right cable when you want to connect a peripheral to your Laptop PC or AT-style PC serial port. Using the patented Smart Cable technology, the SC880 instantly creates the correct interface, eliminating the need for special cables or even an understanding of the data or handshake control lines. It is ideally suited for configuring a printer, modem, another laptop, etc.

The computer connection of the SC880 provides a standard DB-9 (AT-style) connector. The peripheral connection is available in either a Male (-M) or Female (-F) DB-25 connector. Please specify choice when ordering.

SC-880-M with Male Connector

456X580 1-5, \$59.00 ea.; 6-up, \$53.50 ea.

SC-880-F with Female Connector

456X575 1-5, \$59.00 ea.; 6-up, \$53.50 ea.



Data-Tracker

The Professional Breakout Box

Our best selling breakout box, the DT-5 Data-Tracker, is in a class all its own. This premier breakout box, comprehensive interface module and complete cable tester was designed to be the only RS-232 tester you will ever need for most applications. Its simple, straight-forward design and ease of use combine with many outstanding features to make it the favorite among veteran engineers and novice technicians.

As a **breakout box**, only the Data-Tracker allows you to see both high and low signals as well as transmitting data or no signal at all. All four signals are shown simultaneously without patching on all 50 possible lines by means of 100 high-efficiency LEDs, 50 red and 50 green. Its passive design draws power from the interface at a rate of only 2 mA per LED. With the Data-Tracker you can easily see if a line is HIGH (+6 to +25 V, red LED), HIGH (+3 to +6 V, dim red LED), LOW (-6 to -25 V, green LED), LOW (-3 to -6 V, dim green LED) or OFF (-3 to +3, both LEDs off).

As a **custom interface**, the DT-5 is specially designed to allow custom interfacing. Utilizing a combination of 54 gold-plated test points, 30 clearly marked slide switches and supplied mini clip leads, it can be used as an interface device for solving RS-232 compatibility problems quickly.

A supplied internal 9-volt battery allows the DT-5 to be used as a **cable tester**. By simply plugging both ends of an unknown cable into the DT-5, flipping two slide switches and attaching one clip lead (to connect the battery), it will completely show how the cable is configured. All straight-through connections, all cross connections (handshakes), all short and/or open circuits, even all single-sided connections are plainly visible. It will also identify bidirectional cables and locate intermittents. With the optional CTA adapter, it can even test cables from just one end.

The DT-5 is supplied with two 4-foot extension cables, four mini clip leads, a very complete instruction manual/interfacing guide and a deluxe padded carrying case. Several optional adapters are described below to make the DT-5 even more useful and versatile.

400X180 DT-5 Data-Tracker1-2, \$240.00 ea.; 3-up, \$216.00 ea.

DT-5 Options

A. **PT-1 Pulse-Tracker** is a passively-powered RS-232 pulse trap capable of detecting any pulse or data activity on any two signal lines simultaneously.

400X275 PT-1 Pulse-Tracker1-11, \$49.00 ea.; 12-up, \$45.00 ea.

B. **CTA-7 Cable-Test Adapter** utilizes a unique diode matrix which loops test signals to and from the Data-Tracker for single-ended cable testing.

400X050 CTA-7 Cable-Test Adapter1-11, \$30.00 ea.; 12-up, \$27.00 ea.

Blue Box 100

100-LED Breakout Box/Cable Tester

The line-powered Blue Box 100 breakout box and cable tester is a compact, hand-held, full 100-LED test set. It accesses and monitors all 25 conductors of RS-232-C, EIA-232-D and CCITT V.24 interfaces. One

hundred red and green LEDs monitor and display high, low, off and signal activity conditions for each of the 25 conductors on both the DTE and DCE sides of the interface.

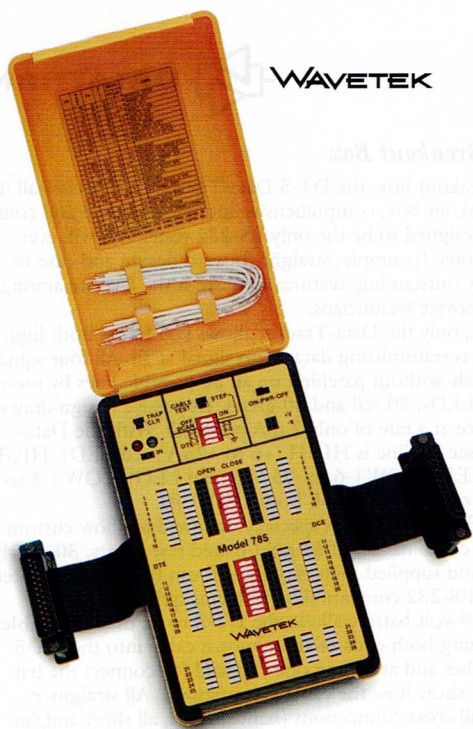
A unique feature of the Model 100 is a special set of eight DIP switches that provides control of often used signals. This eliminates the need for patch cables for crossing TD and RD, isolating signal grounds and forcing RTS, CTS, DCD and DTRs signal to an on condition. Two provided cables have 25-pin male and female connectors to connect to the appropriate DTE and DCE. Other features include three separate loads that can be used to stress any marginal signal by adding loads or to provide termination where required and cable testing.

The Blue Box 100 can test any 25-pin cable for shorted leads, open leads and mis-wires. An optional Remote Cable Test Adapter allows any installed cable to be tested without both ends being in the same location. This unique adapter can detect opens, shorts and even null modem cables from only one end of the cable.

Model 100 comes packaged in a durable high-impact plastic case that measures only 5.5" x 4" x 1.75" and weighs just 13 ounces. It is supplied with two 9-volt long-life alkaline batteries (used for cable testing and switching on and off of signals only), miniature patch cables and a complete guide to operations.

420X400 Model 1001-5, \$230.00 ea.; 6-up, \$215.00 ea.

420X410 100CA Optional Cable Test Adapter35.00 ea.



Easy BOB Model 785

Battery-Powered, 25-Line Breakout Box with Cable Testing

- Isolates and identifies RS-232 (CCITT V.24) interface problems
- Full 100-LED (50 green, 50 red) capability
- Self-powered for high-impedance and extra sensitivity
- Versatile SLIDE switch
- Pulse trap, dual-gender cables on both sides and terminal strips
- Automatic continuity check

Wavetek's top-of-the-line Model 785 Breakout Box (BOB) easily and reliably isolates and identifies RS-232C (CCITT V.24) interface problems. It features full 100-LED capability. With 50 green and 50 red LEDs, each of the 25 lines can be monitored or broken, if desired, by a flip of a SLIDE switch. Two groups of 10 switches and one group of five are located on the faceplate of the instrument. Special SLIDE switches are also located at the top of the unit. One switch allows the user to disable the normal pin 7 as ground to make it transparent (or the same as all other lines) to accommodate common datacom situations without having to jumper them each time.

Easy BOB has advantages by being self powered. High-impedance circuits detect data/control signals and light LEDs without degrading the actual signal. Extra sensitivity detects crosstalk and noise along with normal logic levels. It also features Pulse Trap to detect very short duration changes in the line monitored, dual-gender cables on both DTE and DCE sides plus terminal strips that allow almost unlimited jumpering. Model 785 also performs cable testing. It automatically checks cables for continuity and quickly displays how any cable (terminated with DB-25 connectors) is wired.

Model 785 Easy BOB comes complete with jumper wires, two 9-volt dc batteries and instruction manual. Wavetek's exclusive "Toughpack" high-impact plastic case measures 3.7" x 2.2" x 6" and weighs just .7 pounds. One-year warranty.

Model 785 Breakout Box w/ Cable Testing
204X385 ...1-2, \$345.00 ea.; 3-up, \$317.00 ea.



Model 650

Full-Featured Breakout Box with Tri-State VOM

- Loopback and null modem switches
- Full RS-232 capabilities
- Buffered tri-state LEDs
- 25 DIP switches

Model 650 Tri-State Breakout Box and VOM is one of the most valuable instruments in the field of datacom test equipment. It breaks lines and performs critical voltage measurements on control line circuit data with ease. You won't need several instruments and an array of leads and test clips. The elusive intermittent and/or cold solder joint in cables can be revealed quickly with the convenient ohmmeter reading.

It features Loopback and Null Modem switches as well as the ability to force a voltage on pins 5, 6 and 8 with the flip of a switch. Its ability to measure ohms solves the hide-and-seek approach to connecting to the RS-232 interface by easily finding receivers, not just outputs. This makes measuring marginal control signal levels possible.

The feature-rich 650 has full RS-232 capabilities. Buffered tri-state LEDs and 25 DIP switches monitor both sides of the interface (break out all lines with no interpretation). The 3.5-digit VOM has five fully autoranging ranges: dc V (0.2, 2, 20, 200 V) and ohms (0.2, 2, 20, 200 Ω , 2 k Ω) with an accuracy of 1% + one digit.

Self-powered and battery-operated, Model 650 comes complete with two dual gender cables, a selection of test cables, VOM test leads, battery and operation guide. The included popular "Soft-Pak" case completely protects the instrument and does not need to be removed for operation. This 1.5-pound unit measures 7" x 4.3" x 3" in its case. Lifetime warranty.

Model 650 Breakout Box with VOM
415X300 ...1-5, \$369.00 ea.; 6-up, \$333.00 ea.

Remote Cable Monitor: Use in conjunction with Model 1000 Breakout Box to simplify testing of cables installed within a wall or cable run. The 25 red LEDs indicate connections on the far end of cable under test, resulting from



Model 1000 Datacom Technologies

Four-State Three-in-One Breakout Box

- Four-state signal status of all 25 lines: mark, space, clocking and no activity
- Self-powered for high-impedance and extra sensitivity
- 25 DIP switches and 50 .025 terminal posts for fast and easy reconfiguring
- Two .025 posts provide ± 9 V for strapping control lines to simulate signal states

Four-state Model 1000 is actually three instruments in one rugged, top-of-the-line breakout box. This full-definition model acts as an RS-232 interface tester, parallel interface tester and 25-conductor cable checker. Advanced features speed interfacing of computer equipment and detection of fault conditions.

In normal configuration, Model 1000 is a full-featured RS-232 breakout box with separate red and green LEDs on all 25 interface lines on both sides (DCE and DTE). It has 100 LEDs in all and provides instant line status (mark, space, clocking or no activity). Two 9-volt batteries power 50 high-input-impedance amplifiers to drive LEDs.

This premier tester incorporates buffered circuitry that allows signal line monitoring without affecting signal levels that can force voltages to simulate control line conditions. It allows reconfiguration to test IBM PC parallel interface and provides extra sensitivity to detect troublesome crosstalk and noise.

Unique three-in-one zippered case provides easy access to instrument with included jumper wires, probe and user's manual, replacement battery plus two extender ribbon cables with DB25 dual-gender connectors. The 17-ounce unit is 7" x 4.5" x 2". Lifetime warranty.

Model 1000 Breakout Box
415X350 ...1-5, \$389.00 ea.; 6-up, \$351.00 ea.

power applied at the breakout box. Included test probe checks cable connections further. This 3-ounce monitor is 3" x 3.25" x 1". Lifetime warranty.

415X380 50080 Monitor\$59.00 ea.



Model 60 Blue Box

EIA Interface Monitor and Breakout Panel

This portable, pocket-size test set provides access to all 25 conductors of EIA RS-232 and CCITT V.24 interface between data terminal and data modem. Twelve LEDs monitor the status at the source of twelve primary signals. Two additional LEDs sense either positive or negative voltage levels greater than +3 V and may be used to monitor any line.

Twenty-four miniature switches allow all interface conductors (except frame ground on pin 1) to be interrupted individually for isolated testing and observation of terminal or modem signals. Pins on each side of each switch and small jumper cables (stored in cover) are provided to allow cross-patching and monitoring of signals.

Model 60 is powered by two penlite batteries for over 100 hours of continuous operation. No power is consumed when not in use. The unit weighs 13 ounces with batteries, and overall measurements are 3.75" x 5" x 1.75". Lifetime warranty.

420X060 Model 60.....1-5, \$115.00 ea.; 6-up, \$106.00 ea.

Model 61

Tri-State LED EIA Breakout Box

Model 61 provides the same reliability and service as its forerunner, IDS Model 60 Blue Box. This hand-held, Tri-State breakout box will help you quickly locate and isolate datacom problems at the modem-terminal interface. Model 61 is a compact, battery-operated tester that monitors and accesses all 25 conductors of the EIA RS-232-C and CCITT V.24 interface. Also you can use the 61 to configure prototype cables. Tri-State LEDs monitor 12 key interface signals and indicate space (green), mark (red) or off (no signal) conditions. An additional LED monitors any other desired signal. All Model 61 sensing circuits have an input impedance of greater than 200,000 ohms and will not load down the EIA signals.

Twenty-four miniature ON/OFF rocker switches let you interrupt all interface conductors individually (except frame ground on Pin 1) for isolated testing and observation of terminal and modem signals. Pins on each side of these switches and miniature jumper cables (housed in the cover) let you cross patch and monitor all interface signals. You can reroute signals to pins by opening lines using DIP switches and by cross patching using supplied jumpers. The 1.2-pound unit is 5.3" x 4.2" x 2". Lifetime warranty.

420X061 Model 61.....1-5, \$185.00 ea.; 6-up, \$171.00 ea.

Model 62 Blue Box II

RS-232-C Breakout Panel

The 62 RS-232-C Breakout Box follows in the tradition of the popular IDS Model 60 Blue Box. Choose from Line-Powered Model 62LP and Battery-Powered Model 62BP. The Blue Box II is designed to access and monitor all 25 conductors of the EIA RS-232-C and CCITT V.24 interfaces between data terminal equipment (DTE) and data communications equipment (DCE). All of these signals may be interrupted to allow cross patching. The 62 offers line loading for marginal signal testing or line termination. It interfaces with all modems and terminals and is transparent to EIA RS-232-C or CCITT V.24 interfaces.

This comprehensive tester monitors mark, space or open conditions. The capability for adding up to three additional RS-232-C loads to any desired signal(s) is provided. Twenty-five miniature rocker switches let all interface conductors be individually connected (close) between DTE and DCE or opened (open) for isolated testing. Two additional rocker switches (normal 2 and 3 plus cross 2 and 3) allow crossing of pins 2 (TD) and 3 (RD) between "to DTE" and "to DCE" connectors.

Red and green LED pairs monitor 11 key interface signals and one spare signal. For the line-powered 62LP, each LED monitoring circuit is powered by the signal being monitored. A ground input pin is provided for connecting the RS-232-C-loads and spare LED common to the desired DTE or DCE grounds. The battery-powered 62BP is powered by two 9-V alkaline batteries which provide voltage sources of +9 V for setting undriven signals to a mark or space.

The 62 is specifically designed to perform the following tests: Monitoring the Modem-Terminal Interface, Modem Digital Loop-Back Test, simulating a Modem Eliminator and Self-Test (DTE) Loop Around. Includes three each 1:1 jumpers, one each 3:1 jumper and extensive guide to operations. The 14-ounce unit is 5.3" x 4.2" x 2". Lifetime warranty.

420X162 Model 62LP (Line Powered).....1-5, \$155.00 ea.; 6-up, \$143.00 ea.

420X163 Model 62BP (Battery Powered).....1-5, 185.00 ea.; 6-up, 171.00 ea.

LT-100 RS-232 Line Tester

102-LED Compact Four-State Breakout Box

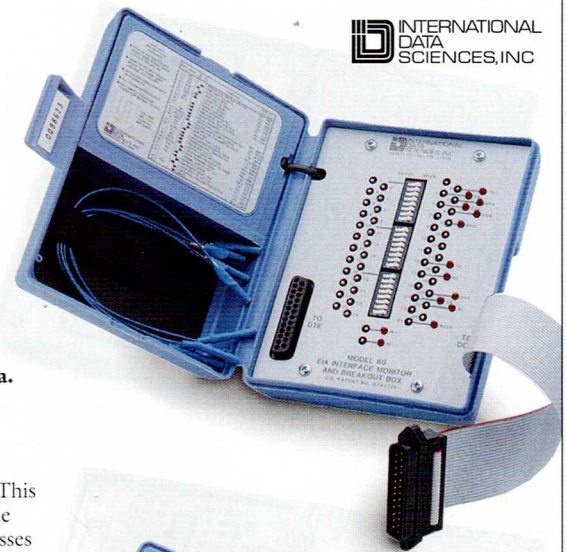
Model LT-100 is the result of incorporating hundreds of field service engineers' requests into a convenient, well-thought-out RS-232 BOB with cable test. The world's most compact, least expensive 100+ LED breakout box is also the toughest and most functional. It features four-state line monitoring on both sides of the RS-232 interface. The state of the interface shows at first glance. LEDs, switches and patch systems are in line on the face plate. Ground Potential Difference Test shows if grounds of connected devices keep the same potential. Current Loop Test (4, 10, 20 and 60 mA) allows testing communications between Short Haul Modems, often used in connection with RS-232 environment.

It contains 51 red and 51 green high-brightness LEDs that are mounted behind the face plate. The face is black for best contrast in bad light conditions. Model LT-100 is line powered and draws a current of only 1.5 mA per LED. It is made with high-quality machined, gold-plated contact material and is nearly indestructible. The tester is supplied with a 12-inch ribbon cable, jumper leads, pouch and user's manual. This 9-ounce unit measures 4" x 3.25" x .7". Lifetime warranty.

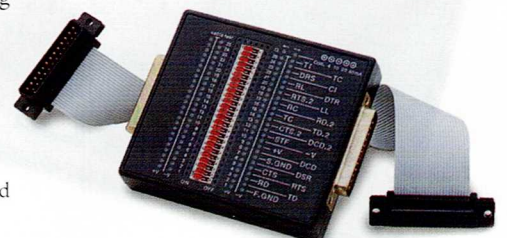
360X500 LT-100 Line Tester.....1-5, \$175.00 ea.; 6-up, \$155.00 ea.

Benedict Computer

INTERNATIONAL
DATA
SCIENCES, INC.



INTERNATIONAL
DATA
SCIENCES, INC.



Datacheck 10

The Economical Breakout Solution for RS-232

The Datacheck 10 is an economical, full-functioned, RS-232 Breakout Box ideal for the field service professional. It has all of the commonly used functions, and the detachable male/female interface cable allows you to connect to any RS-232/V.24 circuit. The Datacheck 10 is line powered, but the current draw is less than 2.5 mA per LED, which ensures that it will not significantly load circuits or affect transmission. It features 12 pairs of LEDs that monitor activity on all key interface circuits. The red and green LEDs show ON (red), OFF (green), CLOCKING (red/green) and UNDEFINED (both off) conditions. An additional spare pair of LEDs also allows you the ability to monitor any two secondary signals. Finally, the Datacheck 10 features an easy-to-read front panel for quick setups and a battery to force signals HI or LOW. It is supplied in a rugged (integral) ABS plastic case which snaps closed to protect the unit. Comes complete with 9-V battery (to power the LEDs only). One-year warranty.

475X380 Datacheck 101-5, \$155.00 ea.; 6-up, \$140.00 ea.

Datacheck 7

100-LED RS-232 Breakout Box

Navtel's state-of-the-art RS-232 (CCITT V.24) line-powered breakout box features 100-LED capabilities. Datacheck 7 is intended for use in the installation of testing data communications equipment and for testing cables. Because of the straight-forward presentation that 100 LEDs provide, a novice user can easily monitor and troubleshoot even complex interfaces without calculating variables or interpretation. Datacheck 7 allows access to all 25 conductors on both the DTE and the DCE sides of the interface. The 100 LEDs (25 red/25 green on the DTE side and 25 red/25 green on the DCE side) are used to monitor the status of all conductors to determine whether the circuit level is spacing, marking, clocking or undefined (off).

Datacheck 7 has many desired features such as dual pulse trap circuit used to isolate intermittent signals, individual Mark/Space source pins for easy cable testing, individual ground isolation switches to connect pin 7 on the DTE and DCE side of the interface to circuit ground and a single 3-2/2-3 conversion switch for instant null modem configuration (handshake). A special note about cable testing: the Datacheck 7 is specifically designed to test all 25-pin (RS-232-type) cables by attaching the battery with a jumper and touching the breakout pins. This indicates whether the cable is straight-wired, specially configured or has a short present. Cables also can be tested remotely (when both ends of the cable can't be connected to the Datacheck and at the same time) with the purchase of the Cable Test Adapter listed below.

Constructed of durable ABS plastic with long-lasting metal hinges, Datacheck 7 comes complete with two-way and three-way jumper wires, detachable 1-foot RS-232 cable and complete user's guide. This unit measures 4" x 6.2" x 1.75" and weighs less than a pound.

475X350 Datacheck 71-5, \$240.00 ea.; 6-up, \$216.00 ea.

475X940 085777 Cable Test Adapter40.00 ea.

Datacheck 2

The Ultimate RS-232 Breakout Box

Datacheck 2 is the most powerful and easiest to use battery-powered breakout box available today. Chosen by many of the world's largest computer and telephone companies as standard equipment, it combines functional enhancements not found on most other breakout boxes. Some of the many features found on this exceptional box are the ability to access all 25 conductors on both DTE and DCE sides of the interface, 25 individually numbered breakout switches for ease of identification and a full 24 LED indicators separated by signal source. Provisions have been made for mark/space/clocking/off identification on all key interface leads, high impedance-sensing circuits and independent mark and space source pins. You get two additional tri-state monitors for secondary signals. All of this plus dual-pulse trap circuits make Datacheck 2 the industry's ultimate breakout box.

Each Datacheck 2 is constructed of heavy-duty molded ABS plastic with a metal hinged lid. It comes complete with batteries, two-way and three-way jumper wires, detachable 1-foot RS-232 cable and comprehensive user's guide. The unit measures 4" x 6.2" x 1.75" and weighs less than 1 pound.

475X270 Datacheck 21-5, \$240.00 ea.; 6-up, \$216.00 ea.

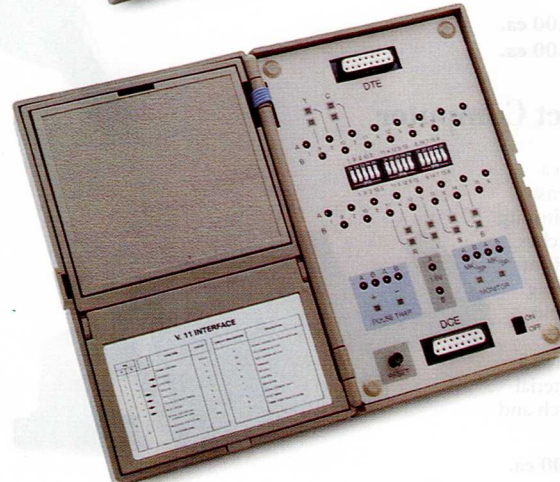
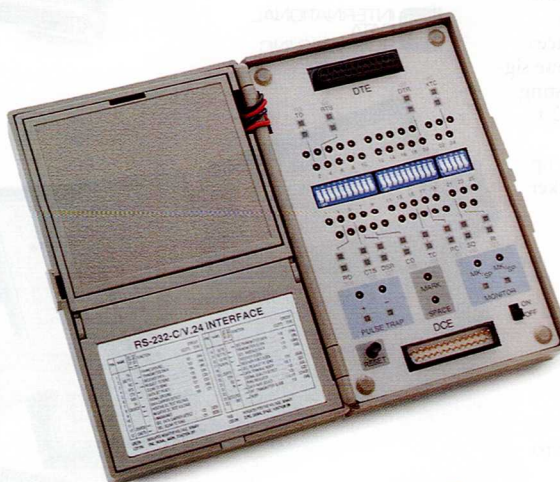
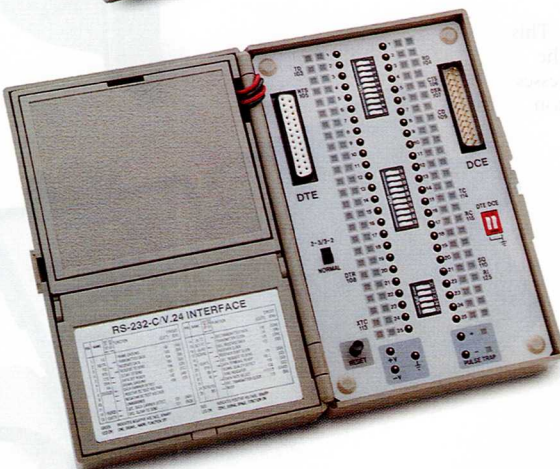
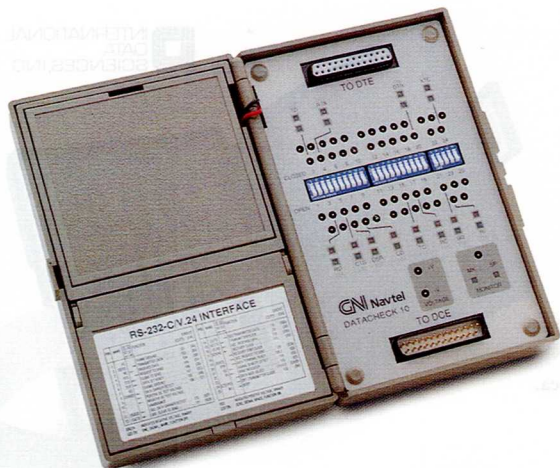
Datacheck 3

Complete RS-422 (X.21) Breakout Box

Datacheck 3 is a line-powered X.21 breakout box with all the features of Datacheck 2 except that it allows access to the 15 conductors on both DTE and DCE interfaces to accommodate X.21 protocol. It may be purchased with an RS-232 Converter/Monitor installed in the lid to monitor non-RS-232 interface activity and convert it for monitoring by RS-232 data analyzers. An RS-232-C DTE can communicate interactively with the X.21 DCE interface in addition to all normal interface breakout and signal monitoring. Constructed of durable ABS plastic with metal hinges, Datacheck 3 comes complete with interface jumpers, X.21 cable and operator's manual. It measures 4" x 6.2" x 1.75" and weighs less than a pound.

475X260 Datacheck 31-5, \$270.00 ea.; 6-up, \$243.00 ea.

475X262 Datacheck 3 w/ RS-232 Converter1-5, \$315.00 ea.; 6-up, \$284.00 ea.



Datacheck 1

The Low-Cost RS-232-C Solution

- Unbeatable low price
- 25 individual breakout switches
- Compact size (4.5" x 3.5" x 1.5")

A reliable, easy-to-use RS-232 breakout box, Datacheck 1 is the ideal tool for installing and troubleshooting remote computer terminals, printers, modems and other datacom equipment. Designed to locate the sources of trouble between DTE and DCE devices, Datacheck 1 has features not found on many breakout boxes costing even twice as much. For instance, there are 25 individually numbered breakout switches (most have only 24 and aren't numbered) which allow the user to interrupt any signal — even Frame Ground. Datacheck 1 is line-powered, includes a monitor that permits four-state indication of a signal (on/off/clocking/undefined) and has 25 contact points on either side of the interface.

Datacheck 1 comes complete with a detachable cable for 25-pin RS-232 type connectors, an assortment of both two-way and three-way jumper wires and a handy user's guide.

475X250 *Datacheck 1* 1-5, \$105.00 ea.; 6-up, \$95.00 ea.

NAVTEL



Blue Box 530

EIA-530 Breakout Box

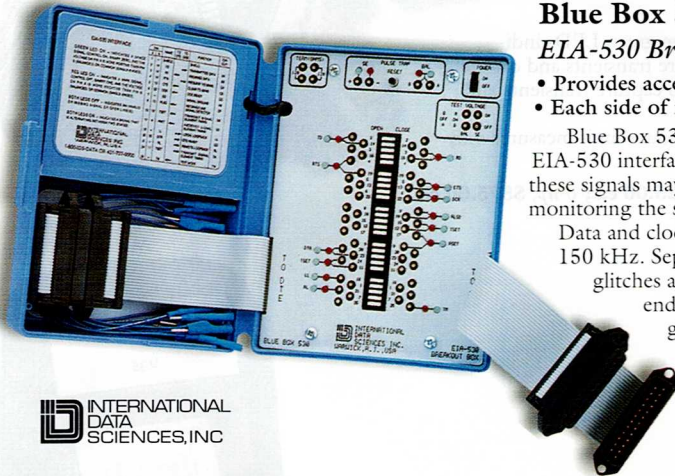
- Provides access to all 25 conductors of EIA-530 interface
- Each side of rocker switches has 25 test points

Blue Box 530 is a hand-held test set used for accessing and monitoring all 25 conductors of the EIA-530 interface between data terminal equipment and data circuit-terminating equipment. All of these signals may be interrupted to allow for cross-patching. Red and green LED pairs are used for monitoring the states of 13 key interface signals.

Data and clock LED circuits operate at rates greater than 2.048 MHz; all other signals, greater than 150 kHz. Separate balanced and single-ended pulse trap circuits (with reset) capture transient glitches as short as 20 nsec. Monitoring circuits meet RS-422 (balanced) and RS-423 (single-ended) specifications. Separate test voltage source pins are provided for balanced and single-ended use. Two 120-Ω resistors are included for terminating signals.

Includes 10 mini-stacking jumpers, attached ribbon cables and two 9-volt alkaline batteries for six to seven hours of use. Lifetime warranty.

420X530 *Blue Box 530* 1-5, \$450.00 ea.; 6-up, \$414.00 ea.



**INTERNATIONAL
DATA
SCIENCES, INC.**

Blue Box 449

RS-449 Breakout Box

- Provides access to all 37 conductors on both sides of RS-449 interface
- Red and green LEDs monitor 13 key interface signals

The IDS Blue Box 449 is the only RS-449 Breakout Box that truly conforms 100% to all RS-449 specifications. All monitoring circuits meet all RS-422 (balanced) and RS-423 (single-ended) specifications with 100% accuracy. This hand-held test set is used for accessing and monitoring all 37 conductors of the RS-449 interface between data terminal equipment and data circuit-terminating equipment. All of these signals may be interrupted to allow for cross-patching.

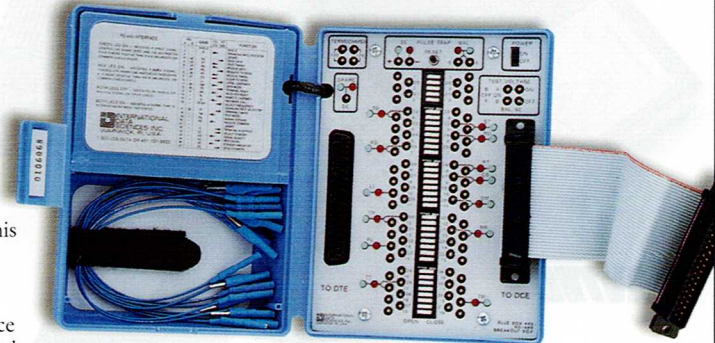
Red and green LED pairs are used for monitoring the states of 13 key interface signals (SD, ST, RD, RS, RT, CS, DM, TR, RR and TT balanced plus LL, RL and TM single-ended). Spare balanced and single-ended monitoring circuits are provided for monitoring any other signals. Fixed 37-position D-type connectors supply connection to the RS-449 interface. The unit's 37 miniature rocker switches individually interrupt each interface conductor. Each side of the rocker switch has 37 test points for monitoring and cross-patching.

Data and clock LED circuits operate at rates greater than 2.048 MHz; all other signals, at rates greater than 150 kHz. Two separate balanced and single-ended pulse trap circuits with reset capture glitches as short as 20 nsec in duration.

Includes separate test voltage outputs for balanced and single-ended. The two 120-Ω resistors terminate signals.

Two 9-volt alkaline batteries in a covered compartment provide six to seven hours of continuous life. The 13-ounce high-impact plastic case measures 5.34" x 4.08" x 1.76".

420X519 *Blue Box 449* 1-5, \$425.00 ea.; 6-up, \$391.00 ea.



Model 336

Universal Parallel Breakout Box

- Handles virtually all parallel printer interfaces
- Observe next or last character strobed across interface
- Centronics parallel connectors (36 pin)

This lightweight, hand-held universal parallel breakout box is a complete TTL-compatible diagnostic instrument that can monitor the data transfer between a computer and a parallel printer. Model 336 provides direct access to all signal lines. Troubleshooting is easily accomplished using switching, patching, pulse trapping, single-step character mode and display circuitry.

Because of the high speed of the parallel interface, the transmission needs to be frozen. Model 336's special control circuitry allows single step examination of the B bit data bus. It monitors 15 lines, has 48 test points and tests voltages. Special features include character step and signal inverters. The 336 also has two-state LEDs with two spare indicators.

Powered by one 9-volt battery. Includes hard Softpak case. Lifetime warranty.

415X200 *Model 336 Breakout Box* 1-5, \$275.00 ea.; 6-up, \$259.00 ea.



Datacom Technologies



Bluebox V.35 Breakout Box

True V.35 Breakout Box for Today's High-Speed Networks

- Data and clock LEDs can monitor signals up to 3 Mbps
- Test voltages allow signals to be forced on or off
- Panel-mounted female connector and male connector at end of cable allow connection to V.35 interface
- Resistors are provided for terminating a balanced (100-Ω) and two single-ended (3-kΩ) signals
- Seven hours of continuous use provided by two 9-V batteries
- Power on/off switch conserves battery life

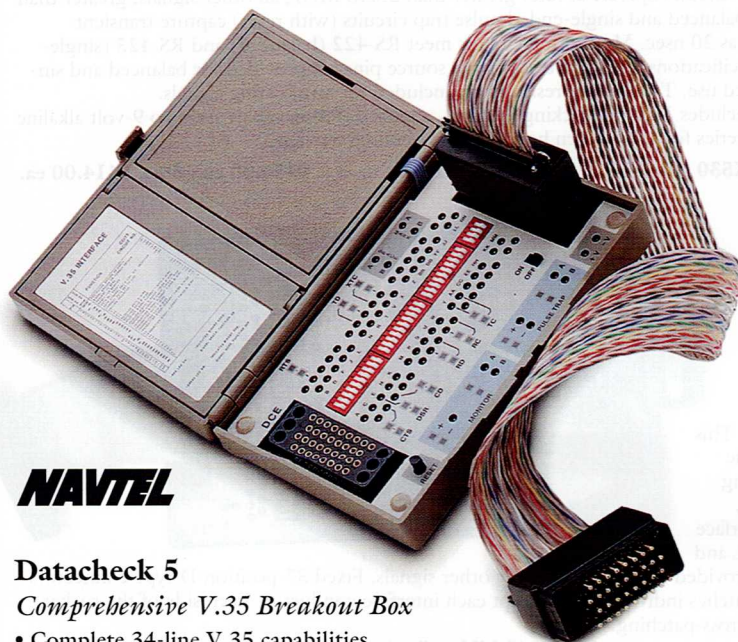
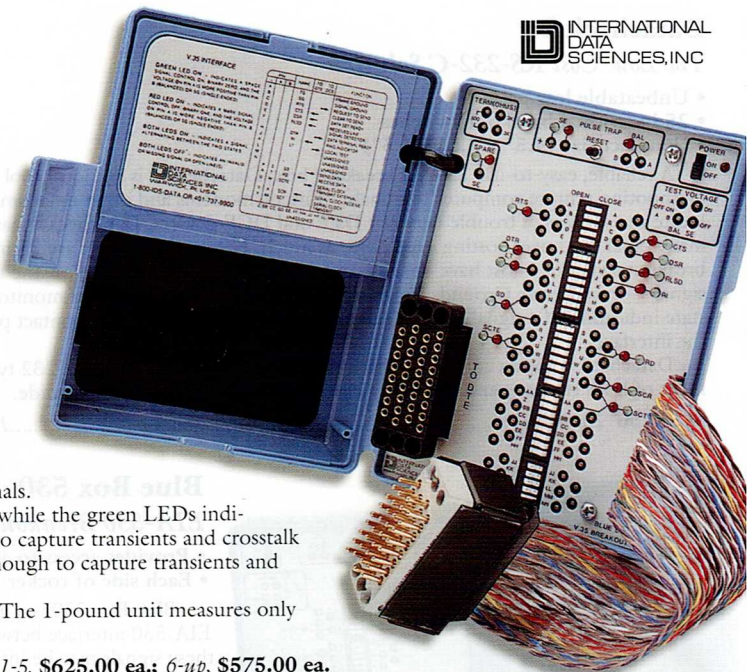
Today data is being transmitted over V.35 interfaces at rates in excess of 2.048 Mbps. The new International Data Sciences BBV.35 Breakout Box is designed to meet these new high-speed requirements. It can monitor and trap data and clock signals at rates in excess of 3 Mbps.

This compact, battery-powered breakout box with an attached cover allows the field-service or design engineer to isolate, access and monitor all 34 conductors of the V.35 interface between the DTE and the DCE. All signals can be interrupted and cross-patched using IDS' unique piggy-back, stacking jumpers.

Red and green LED pairs monitor the status of 12 primary key interface signals. Analogous to traffic lights, the red LEDs indicate the OFF or "stop" condition while the green LEDs indicate the ON or "go" condition. Two separate pulse trap circuits allow the user to capture transients and crosstalk pulses as short as 30 nsec (balanced) and 400 nsec (single-edged). This is fast enough to capture transients and pulses on both T1 and E1 networks.

Powered by two seven-hour 9-volt batteries. Includes spare monitor circuit. The 1-pound unit measures only 5.3" x 4.1" x 1.8". Lifetime warranty.

420X405 Bluebox V.35 Breakout Box with Case1-5, \$625.00 ea.; 6-up, \$575.00 ea.



NAVTEL

Datacheck 5

Comprehensive V.35 Breakout Box

- Complete 34-line V.35 capabilities
- Dual pulse traps
- Optional RS-232 converter/monitor

Datacheck 5 is a battery-powered V.35 breakout box that shares all of the same features of the Datacheck 2 previously described except that it allows access to the 34 conductors on both the DTE and DCE interfaces to accommodate the V.35 protocol. Datacheck 5's many features have made it the virtual industry standard for V.35 testing and interfacing. Features include pulse traps for balanced and unbalanced circuits to detect intermittent signals plus the full complement of 18 LED indicators separated by signal source.

The DTCK-5 with optional RS-232 converter/monitor can be used to perform interactive tests and basically does three things. In addition to all normal interface breakout and signal monitoring, it also allows an RS-232-C DTE to communicate interactively with the V.35 DCE interface. This converter also allows monitoring of non-RS-232 interface activity and converts it for monitoring by RS-232 data analyzers.

Each Datacheck 5 includes detachable V.35 cable, jumper wires, batteries, deluxe leather carrying case and comprehensive operations manual. It measures 4" x 6.2" x 1.75" and weighs 1.5 pounds.

Datacheck 5 Breakout Box

475X3101-5, \$649.00 ea.; 6-up, \$597.00 ea.

DTCK-5 with RS-232 Converter

475X3151-5, \$899.00 ea.; 6-up, \$827.00 ea.

ET-2 V.35 BERT

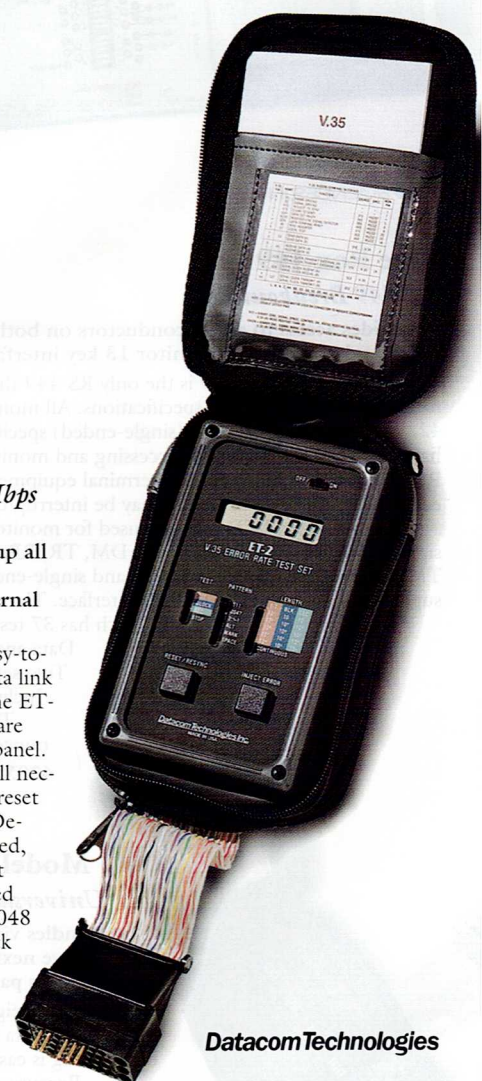
Data Rates to 2.048 Mbps

- V.35 data link testing
- Three slide switches set up all necessary parameters
- Internal batteries or external ac power supply

This sophisticated yet easy-to-use BERT provides V.35 data link testing at a modest price. The ET-2's simplified test functions are clearly labeled on the front panel. Three slide switches set up all necessary parameters. Push the reset button and testing begins. Depending on test mode selected, results will be reported as bit errors, block errors or errored seconds. Data rates up to 2.048 Mbps set by an external clock source can be tested in synchronous data mode.

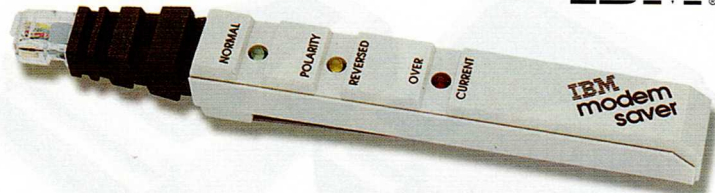
The ET-2 can be powered by either internal batteries or an external ac power supply. Includes Softpak® carrying case with three zippered compartments, three 9-volt batteries, power supply and instruction manual. The 2-pound ET-2 measures 7" x 4.5" x 2". Lifetime warranty.

415X562 ET-2 V.35 BERT1-5, \$810.00 ea.; 6-up, \$734.00 ea.



Datacom Technologies





Modem Saver RJ-11 Jack Tester

This tool is designed to help identify a usable analog telephone line and avoid damage to your analog modem before connection to a modular jack. Insert the RJ-11 style plug into any six-wire modular jack. Then compare the three indicator lights (normal, polarity reversed and over current) to the chart for status and explanation of each indicator light combination. This tester has a polycarbonate case, rubberized connector end (flexible through 180° arc) and stainless steel clip. Power is supplied by telephone line loop current. The .8-ounce unit is 6.5" long and .75" wide.

685X100 Modem Saver1-11, \$32.95 ea.; 12-up, \$29.00 ea.

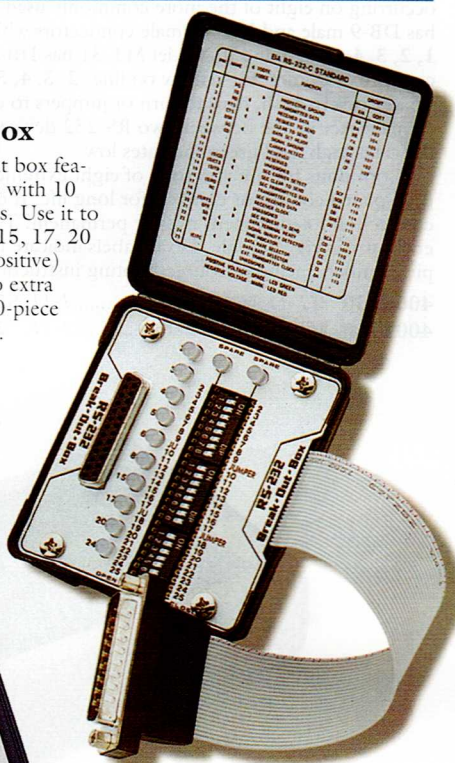
Light(s)	Status	Explanation
NORMAL	●	Normal condition
POLARITY REVERSED	○	Okay to connect modem, and line polarity is correct.
OVER CURRENT	○	
NORMAL	●	Current is okay, but modem may not work.
POLARITY REVERSED	●	Either wiring in Modular Jack or in Tip/Ring leads in the line is reversed.
OVER CURRENT	○	
NORMAL	○	CAUTION
POLARITY REVERSED	○	MODEM MAY BE
OVER CURRENT	○	DAMAGED if connected.
	●	BEFORE connecting, CHECK modem's specs for compatibility and VERIFY line type; analog or digital.
	●	Current is above 90 mA.
NORMAL	○	WARNING
POLARITY REVERSED	●	MODEM COULD BE
OVER CURRENT	●	DAMAGED if connected.
	●	Line current above 90 mA; polarity is reversed.
NORMAL	○	No lights lit.
POLARITY REVERSED	○	No current flow.
OVER CURRENT	○	Line is open or not connected to modular jack.
	○	Do not connect a modem.
	○	

RS-232 Breakout Box

This pocket-sized breakout box features 24 switches and 10 lines with 10 interface signal powered LEDs. Use it to monitor pins 2, 3, 4, 5, 6, 8, 15, 17, 20 and 24. It features a green (positive) and a red (negative) LED. No extra power is required. Includes 20-piece jumpers. Ninety-day warranty.

23-588 Breakout Box
450X150

1-9, \$52.00 ea.
10-up, 44.00 ea.



Model 15 Compact Breakout Box

Model 15 features a clearly labeled front panel and 24 in-line switches. It has .025-inch posts with attendant jumper wires and 49 probe points for easy reconfiguration. Flush-mounted female and cabled male connectors easily connect to an RS-232 line.

Four dedicated, signal-driven, four-state LED pairs indicate key lines TD, RD, RTS and CTS. Two spare LED sets may be used on selected lines. The 4-ounce unit is 3.3" x 3.2" x 1". Lifetime warranty.

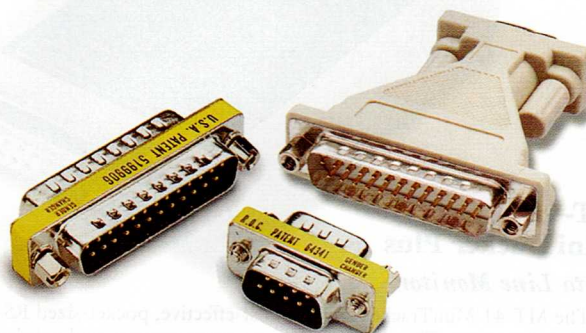
Datacom Technologies

415X015 Model 15 Breakout Box.....1-5, \$124.00 ea.; 6-up, \$112.00 ea.

DB25 Surge Suppressor Port Protection Device

This device protects data lines from spikes and surges from other equipment or those picked up inductively. It eliminates surge induced misread data and data loss. This Surge Protector features eight fast metal oxide varistors (MOVs) on each of the RS-232 lines. It protects 2, 3, 4, 5, 6, 7, 8 and 20. Male to female; insert at port or inline. Ninety-day warranty.

450X225 23-797 Surge Protector1-24, \$21.00 ea.; 25-up, \$15.75 ea.



Mini Gender Changers

These economical Mini Gender Changers are ideal for use where a low profile (LP) is needed in permanent installation. Choose from eight styles. Model 23-699 is a DB25 female to female design. The 23-700 is a DB25 male to male configuration. Model 23-676 is a DB9 male to male style. The 23-695 is a DB9 female to female accessory. Model 23-777 is a DB9 male to DB25 female mouse adapter. The 23-776 is a DB9 female to DB25 male AT modem adaptor. Model 23-805 is a DB9 male to DB25 male configuration. The 23-804 is a DB9 female to DB25 female design. Ninety-day warranty.

450X199 23-699 DB25 F-F (LP).....1-24, \$4.50 ea.; 25-up, \$3.70 ea.
450X200 23-700 DB25 M-M (LP)1-24, 4.50 ea.; 25-up, 3.70 ea.
450X186 23-676 DB9 M-M (LP)1-24, 3.75 ea.; 25-up, 3.20 ea.
450X195 23-695 DB9 F-F (LP).....1-24, 3.75 ea.; 25-up, 3.20 ea.
450X222 23-777 DB9M to DB25F1-24, 3.75 ea.; 25-up, 3.20 ea.
450X221 23-776 DB9F to DB25M1-24, 3.75 ea.; 25-up, 3.20 ea.
450X235 23-805 DB9M to DB25M.....1-24, 6.00 ea.; 25-up, 5.00 ea.
450X234 23-804 DB9F to DB25F1-24, 6.00 ea.; 25-up, 5.00 ea.





MT-21 and MT-22 MiniTrackers

Dual-Purpose Data Line Monitors

Datatron's MT-21 and MT-22 pocket-sized monitoring tools serve dual purposes. Not only do they function as regular line monitors by showing the status of the eight most commonly used RS-232 lines, but they also serve as cable adapters by converting between DB-9 and DB-25 connectors. The MT-21 is a DB-9 male to DB-25 female converter which monitors lines 1, 2, 3, 4, 6, 7, 8 and 9 on the nine-pin side of the tracker. Model MT-22 is a DB-9 female to DB-25 male converter which monitors lines 1, 2, 3, 4, 6, 7, 8 and 9 on the nine-pin side of the tracker.

Both units are constructed with two rows of eight extremely high-efficiency LEDs and gold-plated connector contacts for extended life. Separate red (high) and green (low) LEDs work much better and are easier to read than bi-color or tri-state LEDs. Their extreme high efficiency results in a typical signal load of under 2 mA. Passive design shows relative signal strength which will indicate any marginal signal transmitters or receivers. They do not require batteries, so connection to equipment may be permanent. The pocket-sized ABS plastic enclosures are very durable. Lexan labels indicate both signal abbreviations and pin number. Includes informative troubleshooting instructions. One-year warranty.

400X240 MT-21 MiniTracker1-11, \$24.00 ea.; 12-up, \$22.00 ea.
400X242 MT-22 MiniTracker1-11, 24.00 ea.; 12-up, 22.00 ea.



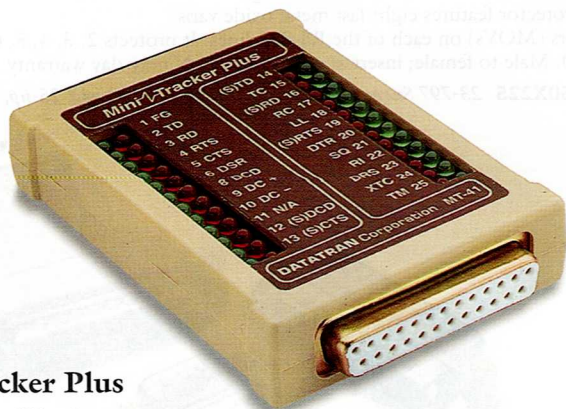
MT-11 and MT-31 MiniTrackers

Data Line Monitors

These pocket-sized monitoring tools are the perfect addition to any computer technician's tool kit. When placed in line between any two RS-232 devices, the MiniTracker allows you to monitor all of the possible conditions occurring on eight of the more commonly used RS-232 lines. The MT-11 has DB-9 male and DB-9 female connectors which monitor activity on lines 1, 2, 3, 4, 6, 7, 8 and 9. Model MT-31 has DB-25 male and DB-25 female connectors to monitor activity on lines 2, 3, 4, 5, 6, 8, 20 and 22. There are no buttons to push, dials to turn or jumpers to connect. Simply insert the MiniTracker in line between two RS-232 devices and observe the LEDs. Red indicates high, and green indicates low.

Both units feature two rows of eight extremely high-efficiency LEDs and gold-plated connector contacts for long life. It does not require batteries, so connection to equipment may be permanent. The pocket-sized ABS plastic enclosure is very durable. Lexan labels indicate both signal abbreviations and pin number. Includes troubleshooting instructions. One-year warranty.

400X230 MT-11 MiniTracker1-11, \$24.00 ea.; 11-up, \$22.00 ea.
400X250 MT-31 MiniTracker1-11, 24.00 ea.; 11-up, 22.00 ea.



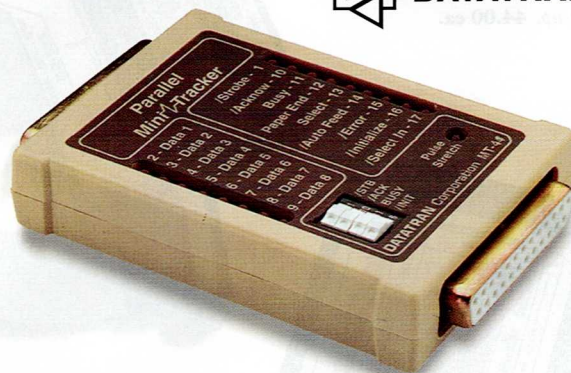
MT-41 MiniTracker Plus

Data Line Monitor

The MT-41 MiniTracker Plus is a cost-effective, pocket-sized RS-232 in-line signal monitor. This compact, easy-to-use computer tool monitors all 24 synchronous and asynchronous signal lines simultaneously. Technicians and sales professionals will benefit from the utility and ease of this interface monitor. DB-25 male and DB-25 female connectors monitor lines 1-6 and 8-25. The 24 red and green high-efficiency LEDs indicate high, low, off or clocking signal conditions on every line except signal ground, line 7. Since it is a line-powered device, LED brightness gives you an indicator of the voltage levels of these signals.

It is constructed with two rows of 24 extremely high-efficiency LEDs and gold-plated connector contacts for extended life. Separate red (high) and green (low) LEDs work much better and are easier to read than bi-color or tri-state LEDs. Their extreme high efficiency results in a typical signal load of under 2 mA. Passive design shows relative signal strength which will indicate any marginal signal transmitters or receivers. They require no batteries, so these units may be connected to equipment permanently. The pocket-sized ABS plastic enclosure is very durable. Lexan labels indicate both signal abbreviations and pin number. Includes informative troubleshooting instructions. One-year warranty.

400X260 MT-41 MiniTracker Plus1-11, \$50.00 ea.; 12-up, \$45.00 ea.



MT-44 MiniTracker

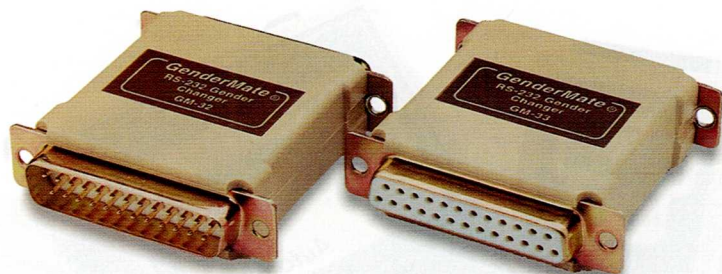
Parallel Data Line Monitor

New to the Datatron line of data monitoring devices is the compact and easy-to-use Parallel MiniTracker. Model MT-44 is designed specifically for DB-25 parallel ports. It monitors all eight lines plus nine status lines. In addition, the MT-44 is equipped with a unique pulse stretch circuit that allows you to see the high-speed activity on any of four status lines. This unit has DB-25 male and DB-25 female connectors which monitor lines 1-17 parallel plus 1 stretch.

It is constructed with 17 plus one extremely high-efficiency LEDs and gold-plated connector contacts for extended life. Separate red (high) and green (low) LEDs work much better and are easier to read than bi-color or tri-state LEDs. Their extreme high efficiency results in a typical signal load of under 2 mA. Passive design shows relative signal strength which will indicate any marginal signal transmitters or receivers. No batteries are required, so this unit may be connected to equipment permanently. The pocket-sized ABS plastic enclosure is very durable. Lexan labels indicate both signal abbreviations and pin number. Includes informative troubleshooting instructions. One-year warranty.

400X265 MT-44 MiniTracker1-11, \$50.00 ea.; 12-up, \$45.00 ea.





High-Performance Adapters

DB-9 Cable Adapters convert nine-pin DB-9 connectors on Apple and IBM equipment among others to standard 25-pin configuration (DB-25) to utilize the MiniTracker. CA-21 (DB-9M and DB-25F) and CA-22 (DB-9F and DB-25M) have all connections straight across. CA-23 (DB-9M and DB-25F) and CA-24 (DB-9F and DB-25M) are RS-232 cross connected.

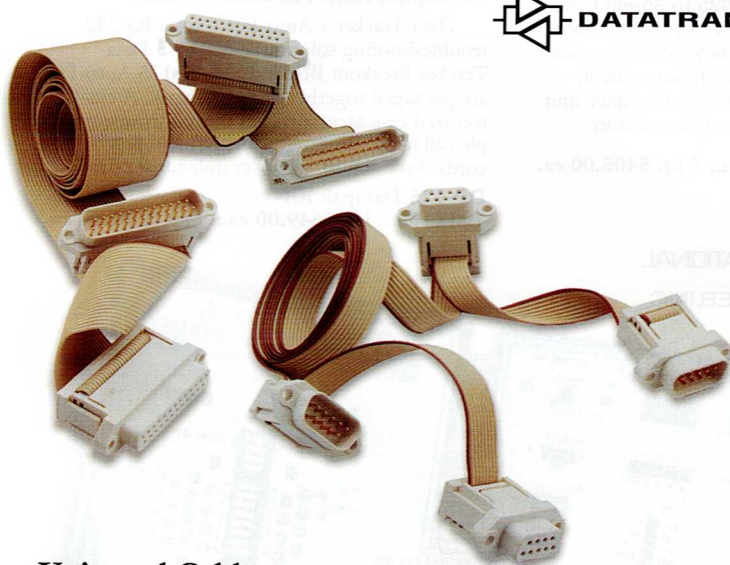
- 400X022** CA-21 Cable Adapter1-11, **\$10.00 ea.**; 12-up, **\$9.00 ea.**
400X020 CA-22 Cable Adapter1-11, **10.00 ea.**; 12-up, **9.00 ea.**
400X023 CA-23 Cable Adapter1-11, **10.00 ea.**; 12-up, **9.00 ea.**
400X024 CA-24 Cable Adapter1-11, **10.00 ea.**; 12-up, **9.00 ea.**

DB-15 Cable Adapters convert 15-pin DB-15 connectors in some Ethernet® networks and other equipment to standard 25-pin configuration (DB-25) for MiniTracker use. CA-32 (DB-15F and DB-25M) and CA-31 (DB-15M and DB-25F) have all connections straight across.

- 400X028** CA-31 Cable Adapter1-11, **\$12.00 ea.**; 12-up, **\$11.00 ea.**
400X026 CA-32 Cable Adapter1-11, **12.00 ea.**; 12-up, **11.00 ea.**

Gendermate Gender Changers are time-saving devices that quickly connect cables with incorrect terminating genders. Male to male and female to female adapters utilize connectors with solid gold-plated pins soldered directly to masked circuit board to increase long-time durability. Choose from GM-12 (DB-9M and DB-9M), GM-13 (DB-9F and DB-9F), GM-32 (DB-25M and DB-25M) and GM-33 (DB-25F and DB-25F).

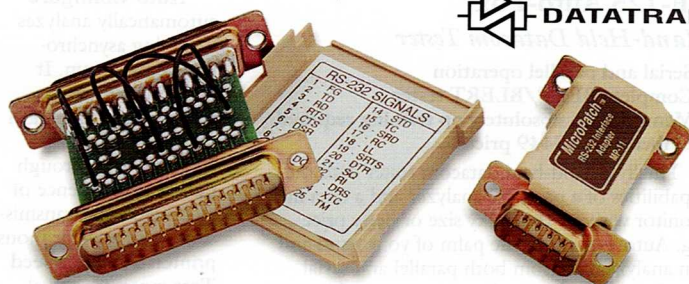
- 400X096** GM-12 DB-9 Male to Male1-11, **\$ 8.00 ea.**; 12-up, **\$7.00 ea.**
400X099 GM-13 DB-9 F to F1-11, **8.00 ea.**; 12-up, **7.00 ea.**
400X105 GM-32 DB-25 Male to Male1-11, **10.00 ea.**; 12-up, **9.00 ea.**
400X100 GM-33 DB-25 F to F1-11, **10.00 ea.**; 12-up, **9.00 ea.**



Universal Cables

Universal Cables are a welcome relief if you do a lot of RS-232 interfacing. Extension cables always plug in regardless of genders involved. As test cables, they pass all signals straight through. Convenient lengths have male and female connectors at each end. These necessary accessories for any serious technician not only save money by saving time but provide versatility to MiniTracker and other types of diagnostic equipment. Choose from 4-foot and 8-foot DB-9 and DB-25 models.

- 400X065** RC-21 4' DB-9 Cable1-11, **\$34.00 ea.**; 12-up, **\$31.00 ea.**
400X070 RC-22 8' DB-9 Cable1-11, **36.00 ea.**; 12-up, **33.00 ea.**
400X055 RC-41 4' DB-25 Cable1-11, **40.00 ea.**; 12-up, **36.00 ea.**
400X060 RC-42 8' DB-25 Cable1-11, **44.00 ea.**; 12-up, **40.00 ea.**



Micropatch

Micropatch is the smallest, most effective RS-232 interfacing adapter on the market. Innovative design allows custom wiring of any RS-232 interface without custom cables. Use with standard, straight-through or existing custom cables without destroying original purpose. Make your own null modem adapters. Allows for quick, easy reconfiguration. With supplied buss strips, multiple or single-sided connections are easily implemented. Jumper wires are easily inserted into sockets through thin membrane of self-healing silicone rubber for continual protection from dust and moisture. Wires are easily removed and reused without soldering. When all necessary jumper wires are installed, they are pressed down next to the board, and the hood is closed. Molded plastic enclosure protects custom wiring when device is in use. It opens easily for future changes or reconfiguration. Designed as a permanent solution, Micropatch also can be a temporary fix.

Choose from two versions. Model MP-11 is designed for reconfiguring DB-9 serial ports. Specifications include: connectors (DB-9M and DB-9F) plus number of sockets and buss strips (9 + 9 + 1x4 + 1x3 = 25). The MP-31 is designed for reconfiguring DB-25 serial ports. Specifications include: connectors (DB-25M and DB-25F) plus number of sockets and buss strips (25 + 25 + 2x3 + 1x4 = 60).

Each Micropatch model includes gold-plated, silicone-covered, mini-spring insertion sockets; jumper wires (2" long, 24-gauge solid, stripped at both ends); two D-type connectors; high-impact plastic enclosure; pins 1 and 7 pre-wired on pc board.

- 400X195** MP-11 DB-9 M and F1-11, **\$20.00 ea.**; 12-up, **\$18.00 ea.**
400X200 MP-31 (DB-25 M and F)1-11, **30.00 ea.**; 12-up, **27.00 ea.**

Spike

Use this RS-232 data line surge protector for 12 of the most commonly used lines. Data communications lines unprotected against static shocks and induced voltage spikes risk reduced equipment life and increased maintenance costs. Twelve Zener Avalanche Diodes (ZADs), far superior to Metal Oxide Varistors (MOVs), clamp high-voltage spikes to within safe levels. Install Spike directly on output port. With a minimal investment, it can save hundreds of dollars and many hours of downtime. Specifications include: connectors (DB-25M and DB-25F), lines protected (2-8, 15, 17, 20, 22, 24, ref shell and #1); clamping voltage (± 18 V); peak power rating (600 W); surge current rating (100 A); response time (> 1 ns).

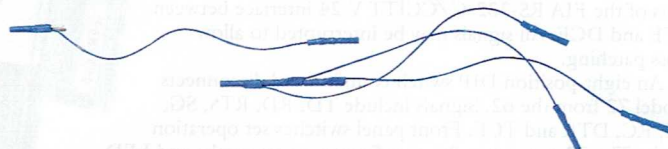
- 400X300** SP-33 Spike1-11, **\$32.00 ea.**; 12-up, **\$29.00 ea.**



Replacement Patch Cable

Replace lost IDS interface jumpers or add capability to any breakout box. Supplied with all IDS interface products, unique cable works 1:1 or daisy-chained for any combination. Sold individually.

- 420X025** 9-400177-7 Patch Cable1-24, **\$6.00 ea.**; 25-up, **\$5.00 ea.**



AF-125 Auto-Fox Hand-Held Datacom Tester

- Serial and parallel operation
- Complete BERT/BLERT tester
- Menu-driven, absolutely no training required
- Unbelievable \$449 price

Finally a hand-held datacom tester with the capabilities of a protocol analyzer and a data line monitor without the bulky size or hefty price tag. Auto-Fox fits in the palm of your hand and can analyze data from both parallel and serial interfaces. It generates Fox messages and is a full-function BERT tester. It receives data, tests it, exercises it, analyzes it and converts it...all for under \$450!

As versatile as it is powerful, Auto-Fox captures incoming data, analyzes it, stores it, allows you to edit and then re-transmit it. It generates its own test data, so setting up or changing transmission parameters is easy. The AF-125 performs standard BERT/BLERT tests and features a unique, quick printer speed test. Auto-Fox works with any equipment that uses RS-232/CCITT V.24 (asynchronous), standard Centronics and Dataproducts parallel protocols. It can perform most of the functions of a professional protocol analyzer but is so easy to operate that inexperienced technicians or salespeople can use it right out of the box!

Auto-Fox provides all basic capabilities for instantly interfacing, servicing and troubleshooting any asynchronous device based on RS-232 interface, Centronics or Dataproducts parallel protocols. It was developed for testing computers, terminals, modems, printers, plotters, multiplexers or any other type of equipment prevalent in a datacom environment.

AF-125 Features

Button Help Function: Lists all shift and alternate button commands

Keyboard Customize Option: Lets you set repeat delay and repeat rate to your preferences

Thruput Speed Tool Kit Utility: Measures current, average and maximum data rates in characters per second on serial or parallel ports in addition to printer speed (not the same as serial baud rate)

Auto-Configure automatically analyzes incoming asynchronous data stream. It displays baud rate, parity, character length and stop bits, easily stepping user through optimized sequence of parameters for transmission to an asynchronous printer. **Printer Speed Test** measures actual throughput speed of any serial or parallel printer in characters per second.

Data Source functions as a source of transmitted data, allowing the user to transmit predefined test patterns (QUICK BROWN FOX, Barber Poles, etc.) plus user-definable messages in serial and parallel formats. **Data Capture** allows for the capture of serial or parallel data. It is stored in a temporary buffer (up to 26K) where it can be viewed, searched or edited and, if desired, saved and transmitted through either port. Data can be converted from real time serial to parallel or parallel to serial.

BERT/BLERT performs a standard Bit/Block Error Rate Test for bits received, bit errors, blocks received, block errors, sync losses, sync loss seconds, parity errors, framing errors, errored seconds, total test time, bit error rate and block error rate.

Powered by a rechargeable ni-cad battery, AF-125 has a 32-character LCD (two rows of 16 characters each). All accessories needed to address everyday needs completely are supplied at no additional cost. Includes batteries, 115-V charger/adapter, multi-adapter (to eliminate compatibility problems), DB25 to 36-pin Centronics adapter, 4' 25-pin "Y" extension cable, two each 2' male-to-female nine-pin cables (for gender compatibility) and reference guide in deluxe padded carrying case. The 12-ounce unit is 5.75" x 3.5" x 1.75". One-year warranty.

400X125 AF-125 Auto-Fox Hand-Held Datacom Tester.....1-2, \$449.00 ea.; 3-up, \$405.00 ea.

IDS Pocket BERT Complete BERT and Breakout Box

The hand-held, microprocessor-based Pocket BERT is really two testers in one convenient unit. It is produced by IDS, the leader in data communications testing. As a full-featured Model 72 BERT, the left-hand side of the unit is capable of testing synchronous data links to 72 kbps and asynchronous data links to 38.4 kbps. It performs Bit Error Test, Percentage Error Free Seconds Test and counts both positive and negative transitions on any interface lead. Plus it can generate FOX messages in ASCII, BAUDOT and IPARS.

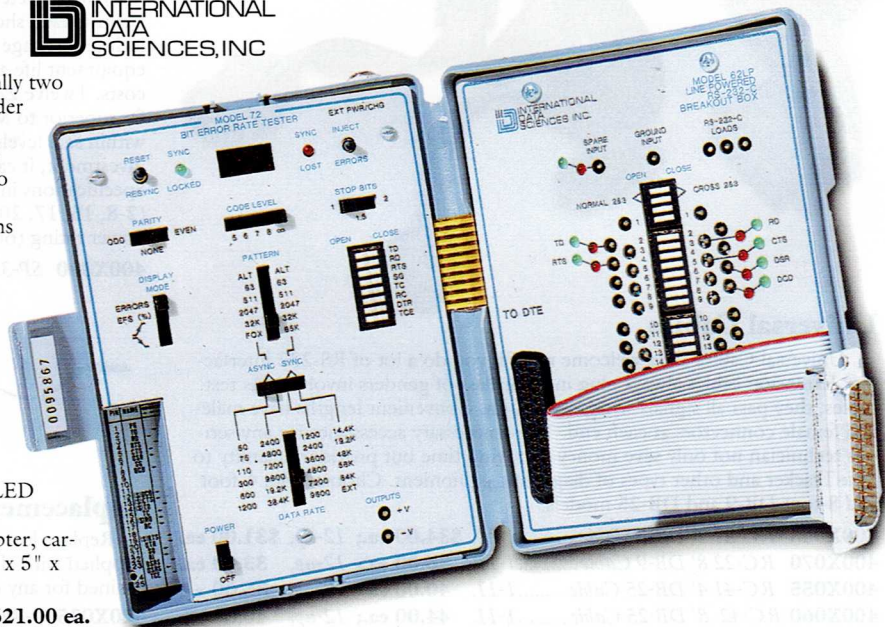
As a full-featured, line-powered 62 breakout box, the right-hand side can monitor all 25 conductors on both sides of the EIA RS-232-C/CCITT V.24 interface between DTE and DCE. All signals may be interrupted to allow cross patching.

An eight-position DIP switch connects and disconnects Model 72 from the 62. Signals include TD, RD, RTS, SG, TC, RC, DTR and TCE. Front panel switches set operation mode. The 72 automatically reconfigures, resets results and LED indicators and reattempts to gain synchronization.

Model 72/62 PB includes jumper leads, batteries, ac adapter, carrying case and user's guide. The 2.5-pound unit measures 8" x 5" x 2.5" including case and adapter. Three-year warranty.

420X072 Model 72/62 PB.....1-5, \$670.00 ea.; 6-up, \$621.00 ea.

INTERNATIONAL DATA SCIENCES, INC.



DP-125 Datapak Combo Kit The Total Troubleshooting Solution

- Complete Data-Tracker breakout box
- Complete Auto-Fox datacom tester

Data-Tracker + Auto-Fox = total RS-232 troubleshooting solution! The DT-5 Data-Tracker Breakout Box and the AF-125 Auto-Fox are packaged together in the Datapak. A customized case securely holds both instruments plus all necessary cables, adapters and patch cords. Save almost \$40 over individual prices!

**DP-125 Datapak Kit
400X190 ...1-2, \$649.00 ea.; 3-up, \$585.00 ea.**



DataTool 5500 Multi-Function Datacom Tester

The First Low-Cost SERIAL and PARALLEL Data Communications Tester with Both Sync and Async Capabilities

DataTool 5500 is a low-cost, field-portable, multifunction interface and data communication tester with a comprehensive feature set previously available only in high-dollar data analyzers. It is actually eight tools in one — data monitor, data trap, bit and block error rate tester, device exerciser, device simulator, breakout box and pulse-level voltmeter. The DataTool is designed expressly for the electronics technician or engineer who installs and troubleshoots computer systems, computer peripherals and their connecting links including off-site telecommunication connections.

The DataTool will test RS-232 serial devices or parallel devices (both input and output). It can simulate a computer port to drive peripheral devices, simulate a peripheral device to receive and trap the output of a computer or trap data transparently to monitor both sides of a data transmission simultaneously between a computer and peripheral device. It even offers expanded capability to handle SDLC links, dual-line trapping or monitoring (allowing both transmitted and received data to be analyzed simultaneously). Plus it detects power drop-outs during BERT tests, stores test data in process and has an expanded message buffer that can be directly output to an external printer.

This remarkable instrument offers a variety of test capabilities. **Pin Analyzing** determines which pins are drivers, receivers, grounds and not connected. It also measures Mark and Space voltages of active drivers.

Analyze Device instantly determines if the peripheral is DTE or DCE and automatically reports baud rate, parity, word length and number of stop bits. **Send Data** transmits a variety of messages to any serial or parallel device. **Trap Data** traps up to 4096 characters (both TD and RD may be trapped simultaneously at 2048 characters per line) and saves them in a buffer for on-screen viewing or hard copy printing. **Printer Setup** automatically determines the configuration of any printer setup (baud rate, parity, word length and stop bits). **Data Throughput** measures characters per second throughput and provides a Figure of Merit indication for serial (async) channels.

BERT (Bit Error Rate Testing) determines errors in a standard data pattern by loopback methodology or in communication with another DataTool instrument or industry-standard BERT tester for end-to-end testing. **Monitor SDLC** allows transparent monitoring of bidirectional SDLC channels, reporting frame error statistics and providing BERT-like error rates measured on an active transmission channel.

Polling can send a polling message to one or more remote units and receive a response. Use **Bias Distortion** to measure mark/space distortion. **Event Timing** measures the delay between transitions on any serial control lead.

Additionally, the DataTool 5500 is a fully featured 100-LED **Breakout Box** (four-state, RS-232) as well as a **Cable Tester**, **Pulse Trap** (for detecting transient pulses + or -) and

Bi-Directional Parallel Interface (Centronics and Data Products-type plus IBM parallel).

The 5500 features a 32-character LCD, 16 non-volatile (variable length) message buffers (2560 bytes), five-year (non-volatile) memory back-up, 100 four-state LEDs and 10 tactile keys with color-coded legends. Internal batteries have a 10-hour life before recharging is necessary. The 2.5-pound unit is 11" x 6" x 2". Includes 3-foot serial hook-up cable (one male end and one dual male/female end), 3-foot parallel hook-up cable (one male and one dual male/female end), seven jumper wires (five each 1:1 and two multi-point), test probe, in-line ac power supply (and charger), deluxe carrying case and operations manual. One-year warranty.

415X500 DataTool 5500.....1-2, \$1225.00 ea.; 3-up, \$1155.00 ea.

Datacom Technologies

DataTool 5500 Features

- Four-state breakout box with 25 lead switching
- 4-k data trap buffer size
- 64-kbps serial (sync) data rate
- 38.4-kbps serial (async) data rate
- 56-kbps max (sync) BERT data rate
- 38.4-kbps max (async) BERT data rate
- Automatic IBM parallel detection
- 2.5-k user message buffer size
- SDLC (NRZ format) trapping and analysis



Benedict Computer

Professional Data Monitor

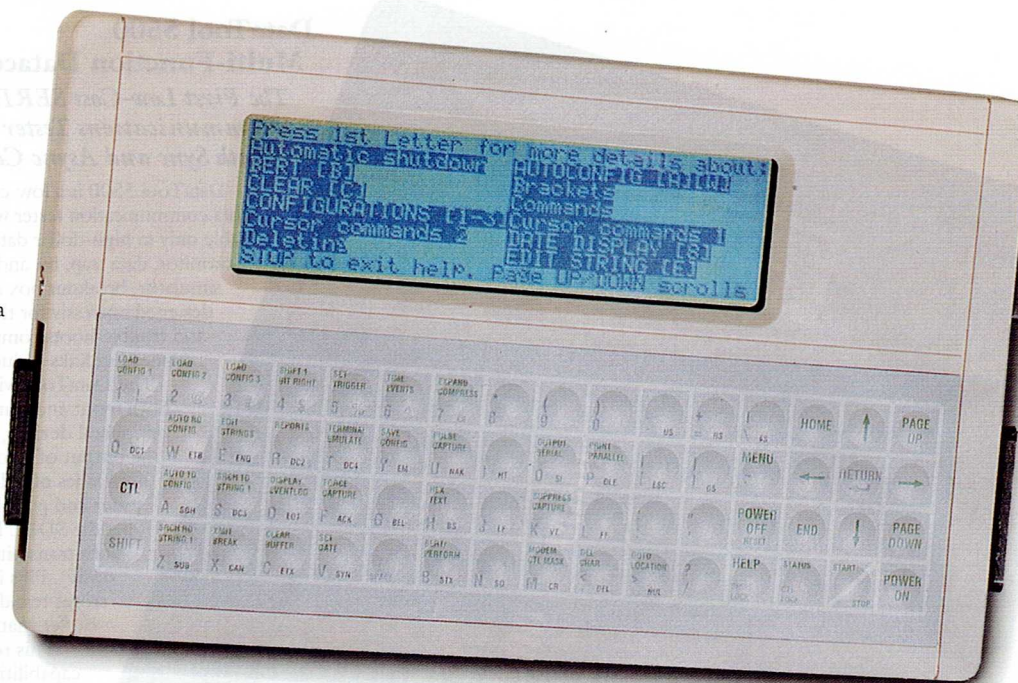
Now with X.25 Protocol Analysis
at No Extra Charge

- Programmable RS-232 protocol analyzer
- Fully functioned BERT tester
- Interface codes: ASCII, HEX, EBCDIC, IPARS, BAUDOT

The DLM-200 Data Monitor is a diagnostic tool for solving synchronous or asynchronous data communications problems. Benedict Computer's top-of-the-line data analyzer is designed to include many of the most needed features not found in other products. It exercises printers, terminals and wide area network equipment in addition to computing performance.

For the price of a line monitor alone, you also get a BERT tester, performance analyzer, response time monitor and breakout box. The DLM-200 averages elapsed character/signal time to measure performance. A BERT/loop test measures accuracy and performance. This unit has remote access, parallel printer port, date and time stamping plus up to 256K of capture buffer. Characters flow in both directions simultaneously on any RS-232 circuit up to 64K bits per second. Unattended operation is facilitated by time and date stamping of circuit errors and user-defined trigger events.

The DLM-200 features a simple menu plus extensive HELP. Most of the 64 functions are clearly printed on the keyboard of this powerful RS-232 troubleshooter. One simple keystroke reduces time hunting through complicated menus and manuals. It provides full duplex monitoring of TD/RD lines plus six interface signals.



DLM-200 Specifications

Speed (analyze): 75-64 K sync; 75-57.6 K async	Interface: (2) RS-232C (monitor), (1) Centronics parallel, (1) RS-232C (control)
Speed (remote): 1200, 2400, 4800, 9600, 57.6 K async	Protocol: async, sync, SDLC, HDLC, X.25 (Level 3)
Display: LCD 8 lines by 30-40 characters	Connectors: 3 DB25 (2 female, 1 male)
Buffer Size: 128 K (256 K optional)	Power: 9-volt alkaline battery/wall transformer
Codes: ASCII, EBCDIC, IPARS, BAUDOT (5-bit)	

You'll be amazed at how quickly you can autoconfigure and capture data, change ASCII to HEX display, load saved configuration, enter terminal emulation, enter string editor, enter configuration menu, search for a string pattern, clear the buffer and transmit a string. The DLM-200's easy-to-read screen displays up to 320 transmitted and received characters.

Powered by a standard 9-volt battery, it has automatic user-definable power-down on inactivity. This full-powered tester is the smallest protocol analyzer available. It's a compact 9.25" x 5.25" x 1.25" and weighs less than 2 pounds. Includes breakout box, 3-foot cable, 9-volt battery, remote adapter, carrying case and operations guide. One-year warranty.

DLM-200 Sync/Async/Remote/128-K Monitor
360X200.....1-2, \$1895.00 ea.; 3-up, \$1699.00 ea.

Benedict Computer

Economical RS-232 Data Monitor

Powerful Diagnostic Tool at a Bargain Price

- For installation, testing and monitoring data circuits
- Compact, lightweight and battery-powered for portability
- Buffers hold up to 28 KB of data

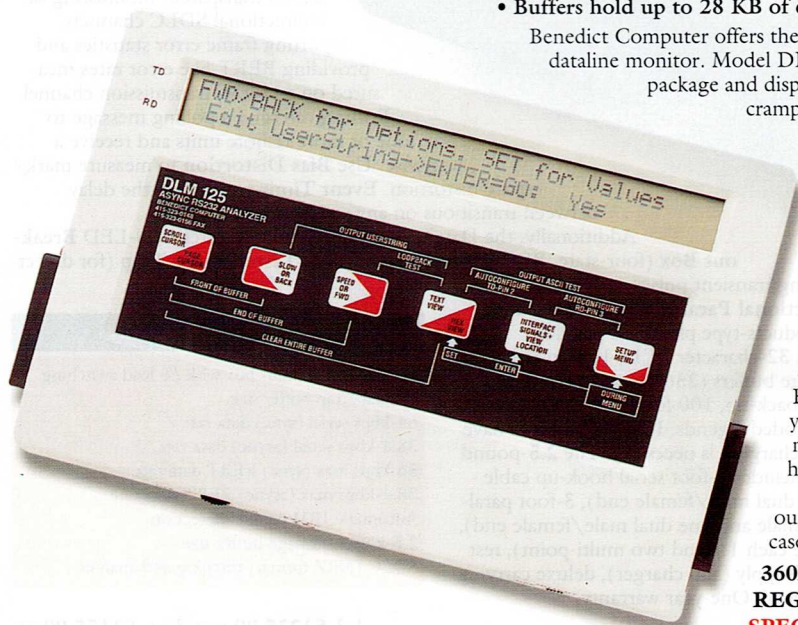
Benedict Computer offers the unbeatable combination of affordable convenience in a portable dataline monitor. Model DLM-125 is an asynchronous line monitor/tester featuring a small package and display with an unbelievably low price tag. It is designed for use in cramped quarters and out-of-the-way locations. This compact, lightweight

monitor is battery powered for portability and hand-held use. Functional keys simplify testing ability. With just six soft-touch and two sliding switches, the DLM-125 can be held in one hand and operated with the other. It's easy enough for novices to operate immediately yet so fully featured that seasoned pros will be amazed by the level of sophistication packed into this compact, budget-priced instrument.

Datacom technicians, circuit designers and programmers can observe the flow of data on the line being monitored. Transmitted and received data are shown simultaneously on the two-line-by-40-character display. It offers a 75-64000 bps data rate (ASCII, EBCDIC, BAUDOT or IPARS). The menu is stored in memory so you can configure or reconfigure it in place without referring to the manual. The DLM-125 can be configured as a monitor, storage device holding up to 28 KB of data or tester. It provides printer output.

Model DLM-125 measures 5" x 8" x 1.2" and weighs just 19 ounces including batteries. It comes complete with batteries, carrying case, operations guide and one-year warranty.

360X100 DLM-125 Async/32-K RS-232 Data Monitor
REGULAR PRICE.....\$795.00 ea.
SPECIAL PRICE\$649.00 ea.



Datatest 9440 Protocol Analyzer

NAVTEL

*State-of-the-Art Protocol
Analysis at an Unbelievable Price*

- X.25 Logical Channel Number (LCN) filtering in real time
- Easy-to-use, real-time multitasking operating system
- Comprehensive built-in decodes for SNA and X.25
- SNA filtering in real time
- Data trap and interface timer built into monitor
- Bit Error Rate Testing (BERT) and CCITT G.821 compatibility
- True 24 x 80 VT-100 terminal emulation
- PS/2 file compatibility

Navtel's Model 9440 Protocol Analyzer is a data communications tool designed for field service. Analyze live data circuits by displaying them on the screen and decoding them in a variety of ways. It can also pretend to be a terminal, controller, modem or other device and communicate with other network components to ensure their correct operation. Activity of selected leads can be viewed on data interface with a breakout box right next to the screen. The 9440 can utilize special tests to measure the performance of a communications link.

Just a few hands-on moments with the 9440 reveal its intuitive operating system, greatly reduce training time and thus increase productivity. This and its wide variety of testing capabilities, protocol decodes and remote dispatch support functions make the 9440 ideal for field service. Its ability to send/receive PC/XT/AT/PS2 compatible files with XMODEM protocol allows central site personnel to download switch or system configuration software into test set for re-transmission to remote devices. Featuring full-screen VT-100 emulation, it allows practical communication with local or remote databases for customer files, information access or device configuration.

What really separates Datatest 9440 from its competition is high-speed operation at full 64kbps to monitor, decode and perform BERT tests on very high speed data links and simulation abilities for exercising a myriad of network devices. The 9440 has unprecedented standards and interface functionality. It has full CCITT (G.821) compliance and multiple interface support for RS-232/V.24, Mil-188, V.35, X.21, RS-422/423 and RS-449 (V.36).

Includes integral RS-232/V.24 breakout box, 1.44 MB disk drive, 5-foot dual gender RS-232 test cable, interface test jumpers, test applications library and manual. The 16.5-pound unit is 7.1" x 13.2" x 15.7". One-year warranty.

Model 9440 Protocol Analyzer

475X700.....1-2, \$5990.00 ea.; 3-up, \$5625.00 ea.



Optional Accessories

475X715	X.21 Option Module.....	\$565.00 ea.
475X720	X.25 Option Module.....	495.00 ea.
475X725	SNA Option Module.....	495.00 ea.
475X730	V.35 Option Module.....	995.00 ea.
475X735	RS449 Option Module.....	730.00 ea.
475X790	Transit Case (84-100384D).....	495.00 ea.

Datatest 2 Plus

NAVTEL

This is the most sophisticated data communications test set of its size available. Its functions are hard for competitors to match, yet Datatest 2 Plus is only a fraction of their size, weight and cost! It's specifically designed for testing modems, terminals, printers, controllers, statistical multiplexers, cables and more.

Simulate dumb terminals, perform complex protocol emulation tasks and isolate faults on DTE or DCE active circuits. MONITOR mode provides a 4k buffer and powerful trapping capability. POLL mode easily exercises multipoint polled networks.

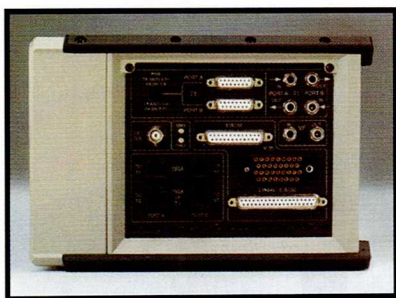
Power up in BERT mode to run 17 different functions and measurements simultaneously. Perform secondary tasks such as trap, alarm, etc. BERT mode is very efficient. Concurrently display transmit and receive data, enable timer and summarize selected line parameters. Count bits received, bit errors, parity errors, BCC errors, sync losses and time outs. Datatest 2 Plus keeps moving in BERT mode, automatically performing BERT and BLERT calculations. For testing statistical multiplexers, it allows X-on/X-off and EIA flow control while it traps errors on the display.

The ability to expand makes Datatest 2 Plus unique. Optional application packs can be inserted for testing specialized protocol such as SNA and X.25 and for measuring distortion. Store customized test sequences and user messages on Program Packs. Optional Data Packs can be used to store complete test results. Test sequences and/or results can be communicated between two Datatest 2 Plus units over any communications link or output to any ASCII printer for hard copy documentation.

Now you can buy a Datatest 2 Plus for BERT testing up to 72 Kbps full duplex. Special V.35 cable option connects to line under test and includes ac adapter to supply power. It is the most powerful datacom test set in its class! Each 3-pound unit is 2.5" x 8" x 5.5". Includes interfacing 2-foot ribbon cable, four straight and two three-pin daisy chain jumper wires plus manual.

475X600	Datatest 2 Plus Tester	1-2, \$2275.00 ea.; 3-up, \$2139.00 ea.
475X605	Datatest 2 Plus w/ V.35 Option.....	1-2, 3319.00 ea.; 3-up, 3120.00 ea.
475X620	Option A (X.25 Pack)	300.00 ea.
475X630	Option D (Distortion Packs)	260.00 ea.
475X635	Option E (SNA Pack)	300.00 ea.
475X625	084754 (Leather Carrying Case)	105.00 ea.
475X640	084146 (Soft Pack Carrying Case).....	140.00 ea.
475X670	PP/2 (Optional Program Pack)	250.00 ea.
475X660	DP/2 (Optional Data Pack)	310.00 ea.





NAVTEL

Model DST 2000

Comprehensive Datacom Tester

- Tests Layer 1 (physical), 2 (data link) and 3 (network)
- Goes beyond the BER test
- Powerful range of tests
- Wide choice of result formats
- Provides superior service to your customer

The DST 2000 is a new-generation tester designed by Navtel to meet the challenges of supporting new protocol-dependent services such as Frame Relay, X.25, etc. They can be deployed only if all relevant layers perform cohesively. DST 2000 verifies presence, configuration, connectivity, performance and capacity of all relevant layers needed to send the service. By verifying all parameters needed to deploy complex data services successfully, DST 2000 helps ensure quality transmission and high network up-time. But Model DST 2000 offers even more. Its modular architecture combined with ongoing development to test complex new services at speeds up to 1.5 mbits/s will protect your investment beyond the year 2000.

Powerful test range includes extensive service emulation tests plus Layer 1 signal analysis and BER tests. With just one instrument and one network connection, service integrity, configuration and performance are completely analyzed. Perform emulation tests from four-wire interface or one of the DST 2000's many built-in data interfaces.

When an outage occurs or a service is suspect, the DST 2000 Data Tester performs a number of in- or out-of-service tests to isolate the problem quickly to the CPE, local loop or carrier's network. In-service monitoring combined with Drop and Insert capabilities maintain the best possible service to your customer. Testing unattended around the clock or via remote control, Model DST 2000 also helps diagnose elusive intermittent problems.

This tester offers a wide choice of result formats. The start and end of each test as well as the occurrence of errors or significant events are time stamped. Test results can be displayed, autosaved to memory or printed. The extensive array of LEDs provides instant recognition of errors, protocol and service violations. More detailed information is available through statistics that appear on the unit's large 40 x 20 LCD. It allows logical grouping of all pertinent information on one screen.

Features simplified user-friendly keyboard, built-in speaker and microphone, soft key labels and data interface signal activity pad. Layer 1 activity panel displays signal/error presence. Panel displays framing and coding used by Layer 1 under test. DST 2000 supports many common interfaces. EIA-232, V.35, EIA-449/530 data interfaces are software selectable.

Optional accessories are available separately. Your choice of five factory-installed options must be specified at the time of your DST 2000 order because they cannot be added at a later date. The Remote Control allows the placement of DST 2000(s) in unmanned or partially manned offices and control from central diagnostic center via IBM or compatible personal computer. A PC can talk to the tester via leased, dial or X.25 connections. The 13.5-pound DST 2000 is 6" x 12.75" x 8.75". One-year warranty.



DST 2000 Specifications

Key Features	Description	Benefits
Ability to monitor and emulate protocol dependent services (i.e., Frame Relay, X.25)	Functionality of all service layers is tested simultaneously	Complex services can be tested in minimal time and with higher accuracy
Eliminates need to cope with protocol decodes	Provides service analysis by verifying presence, configuration and connectivity plus calculates network performance and capacity	Saves time, eliminates errors and simplifies technician training requirements; service verification and problem isolation made easy
Multi layer automatic configuration on Layers 1-3 to simplify setup	Auto configures on service specific options (i.e., Frame Relay LMI standard) as well as Layer 1	Minimizes setup time and eliminates configuration errors
Non-intrusive monitoring	Calculates statistical results based on user data	Customer's service is not interrupted during service analysis
Fractional or Full T1 G.821 BERT from T1/4-wire or Data Interfaces	Checks Layer 1 performance in out-of-service or Drop and Insert mode	Accurate and complete Layer 1 verification according to approved standards
Extensive Drop and Insert capability using two receivers and two transmitters	Allows inserting service dependent traffic or BER patterns on selected channels; drops channel(s) to VF or data interface to connect external test sets (TIMS or protocol analyzer)	Maintains service on good channels while testing suspect channels; minimizes service and customer interruptions
Multiple connector options for connecting to T1/4-wire local loop	Allows connection to 2 x DA-15, 4 x bantam or 2 x RJ45 connectors	Permits use of most convenient connector and cable type; no external interface modules required
Software selectable multiple integral data interfaces	Interfaces supported include EIA-232, V.35, EIA-449/530	Easy local or remote testing of most common data interfaces; enables user to test CPE equipment
Investment protection; field upgradeable for services you require	Support for existing and future high-speed data services (Frame Delay, X.25)	Provides a platform that grows with your testing needs beyond the year 2000
Portability	Rugged and lightweight unit also can be placed on end when space is at a premium	Take it anywhere and place it anywhere

DST 2000 T1 Data Tester

475X800	.....1-2, \$9995.00 ea.; 3-up, \$9550.00 ea.
475X815	01-102515A Soft Pak Case .....250.00 ea.
475X820	01-102520A Handset with Cable .....40.00 ea.
475X831	01-102531A Frame Relay Factory-Installed Option ....1195.00 ea.
475X832	01-102532A Remote Control Factory-Installed Option .995.00 ea.
475X833	01-102533A DDS Factory-Installed Option .....995.00 ea.
475X835	01-102535A T1 Pulse Mask/Shape Factory-Instld Option .600.00 ea.
475X837	01-102537A X.25 Factory-Installed Option .....995.00 ea.



Serialtest®

PC-Based Protocol Analyzer and Data Line Monitor

- Turns any PC into a full-featured sync/async protocol analyzer
- No add-in boards or special hardware required
- Performs tests at a fraction of the cost of specialized hardware
- ComProbe adapter works with sync/async devices
- Features frame and packet level decodes
- Portable instrument is easy to carry and inexpensive to ship

Serialtest is an alternative to the expensive, specialized hardware traditionally used for data communications problem solving. Your PC is a powerful yet economical platform for datacom testing, and Serialtest unleashes that power with a simple, user-friendly interface. It turns any PC — even laptop and notebook computers — into a full-featured sync/async serial data protocol analyzer. Serial data communications problems can be diagnosed and solved quickly, easily and affordably.

Field service engineers and system integrators appreciate Serialtest's portability and ease of use. Communication specialists and network supervisors enjoy the power and flexibility. Package includes software and an RS-232 ComProbe™ adapter. Connect the adapter to your computer via the parallel printer port so Serialtest will work with both synchronous and asynchronous devices. This indispensable troubleshooting tool supports all popular protocols including sync, async, HDLC, SDLC, X.25 and SNA.

Pop-up menus and context-sensitive help have new users up and running quickly. Command line options can simplify operation further. Monitor mode shows exactly what information — both data bytes and control signals — is flowing between any two serial devices. Source mode interactively simulates the DTE or DCE side of the communications link.

Data can be captured to RAM and directly to disk with no capture file size limit. Captured data includes data bytes, control signals and error conditions. It displays data by frame/packet and byte levels. Captured data search can include wildcard characters. Control signal display is graphical, using a software breakout box with timing diagrams and counters. Timestamping can be displayed in absolute or relative event time with Delta time and effective data rate calculations.

Character string, control signal and error condition triggers can activate and deactivate data capture. String triggers can include wildcard characters. Enter transmit data from the keyboard, Serialtest capture files or any DOS file. You can modify control signals plus name and save an unlimited number of configurations for future recall.

Serialtest is powered by an external ac/dc adapter or internal 9-volt battery. Includes software, RS-232 ComProbe adapter, cables and ac/dc adapter. Documentation includes context-sensitive help, setup guide and user's manual. The 12-ounce unit is 7" x 3" x 1.25". Thirty-day warranty.

555X400 STC Serialtest1-2, \$1495.00 ea.; 3-up, \$1360.00 ea.

Serialtest Specifications

System Requirements: IBM PC or compatible, parallel port, minimum 350-kB main memory, MS DOS version 2.0 or higher, disk drive (hard drive not required)

Data Interfaces: RS-232, Mil STD-188

Sync Baud Rates: Up to 64-k bps including support for user-defined non-standard baud rates

Async Baud Rates: Up to 38.4-K bps including support for user-defined non-standard baud rates

Operating Modes: Monitor, source DTE, source DCE

Communication Modes: Async, sync — NRZ, sync — NRZI (external clock); sync — NRZI (internal clock)

Level 2 Protocols: Monosync, bisync, bisync-BCC, HDLC, SDLC

Level 3 Protocols: X.25, SNA

Flow Control: Software (including user-defined XON/XOFF characters), hardware (RTS/CTS), hardware (DTR/DSR)

Character Sets: ASCII, 7-bit ASCII, EBCDIC, Baudot

Parity: None, even, odd, ignore

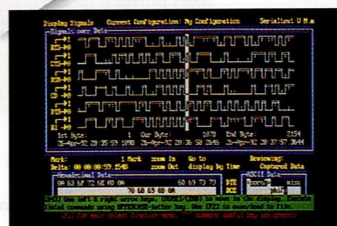
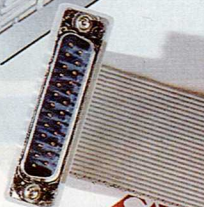
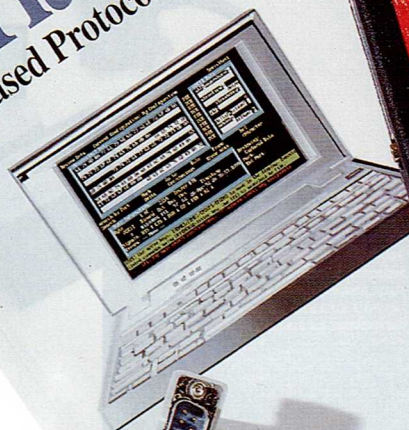
Word Length: 5, 6, 7, 8 bits

Stop Bits: 1, 1.5, 2

Autobaud: Attempts to determine baud rate, parity, word length and stop bits

Serialtest®

PC-Based Protocol Analyzer



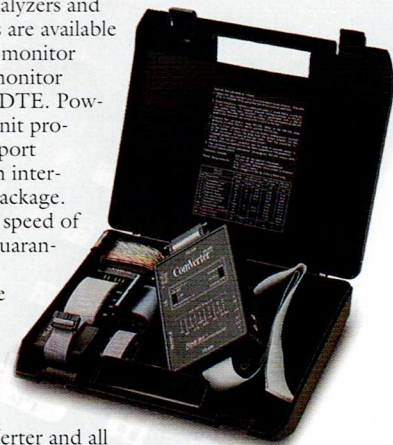
RS-232 ComVerter

Multi-Standard Communication Converter

Designed from the bottom up with the field service technician in mind, the RS-232 ComVerter adapter is a highly compact bidirectional communication converter. This converter allows RS-232 equipment to support the RS-422, RS-449, RS-530, V.10, V.11, V.35, V.36 and X.21 interfaces. It is also a perfect companion to Frontline's family of portable, affordable and easy to use PC-based protocol analyzers and BERTs. Three convenient modes are available on the ComVerter. The unit can monitor DTE and DCE, emulate DTE/monitor DCE or emulate DCE/monitor DTE. Powerful yet simple to operate, this unit provides everything necessary to support common data telecommunication interfaces in one small, easy to carry package. ComVerter provides a maximum speed of 200,000 bits per second with a guarantee of 115,200 bits per second.

Powered by a 9-V battery, the ComVerter comes with an external ac/dc adapter. With the use of special provided power cord, the ComVerter and an RS-232 ComProbe® can share a single ac/dc adapter. The ComVerter and all cables come in a plastic carrying case which additionally accommodates one ComProbe. Weighing less than 1 pound, the RS-232 ComVerter is 3.4" x 5.5" x 1.25". The total weight of the loaded case is less than three pounds. Thirty-day warranty. ComVerter was designed to work with the STC Serialtest but can be used in any application.

555X100 ComVerter1-2, \$799.00 ea.; 3-up, \$750.00 ea.



Serialtest Async

PC-Based Serial Data Analyzer for Asynchronous Testing

- Async-only version with monitor and source modes
- Use with IBM PC/XT/AT or compatible
- Observe data and control signal changes
- Intuitive and user-friendly format

Serialtest Async is a specialized software alternative to traditional and expensive dedicated serial data analyzers. It maximizes your investment in the computer hardware you already own. Similar to the Serialtest, this model is limited to asynchronous testing. It supports monitor and source operation. Monitor mode allows you to monitor one or both sides of the data flow between two serial devices. Serialtest Async passively taps both RS-232 data lines and the major control signal lines. Source lets you provide one side of the data communications link. Send data from the keyboard, a file or both at the same time. You can even change the states of the control signals for the side you are supplying.

The async version provides a rich selection of features for maximum flexibility and ease of operation. They include graphic control signal timing diagrams, split line DTE/DCE display, timestamping with delta time calculations, effective data rate and CRC/checksum calculations plus user-defined nonstandard baud rates. The Serialtest Async can be used with one COM port, but two are required for bidirectional monitoring. Includes 5 1/4" and 3 1/2" software diskettes, custom cabling plus User and Setup Guide. Thirty-day warranty.

STA Serialtest Async

555X300 1-5, \$295.00 ea.; 6-up, \$265.00 ea.



Serialtest Async Specifications

System Requirements: IBM PC or compatible, one serial port for source mode or monitoring one device, two serial ports for bidirectional monitoring, minimum 300-KB main memory, MS DOS version 2.0 or higher, disk drive (hard drive not required). Supports serial ports COM1-COM4

Data Interface: RS-232

Async Baud Rates: Up to 115.2-Kbps with support for user-defined non-standard baud rates

Operating Modes: Monitor, source DTE, source DCE

Communication Mode: Async

Flow Control: Software (including user-defined XON/XOFF characters), hardware (RTS/CTS), hardware (DTR/DSR)

Character Sets: ASCII, 7-bit ASCII, EBCDIC, Baudot

Parity: None, even, odd, mark, space

Word Length: 5, 6, 7, 8 bits

Stop Bits: 1, 1.5, 2

Autobaud: Attempts to determine baud rate, parity, word length and stop bits

KickStart IRQ™

The All-in-One Solution for IRQ Problems and System Troubleshooting

- Eliminates IRQ and DMA woes
- Includes IRQ/DMA detection software
- Monitors power supply voltages
- Displays POST code test results
- Provides on-board diagnostics

Tired of wasting valuable time chasing down IRQs and DMAs when installing new components? Now you can eliminate configuration problems with Quarterdeck Select's KickStart IRQ™ card. It's the all-purpose card that lets computer enthusiasts, MIS/DP managers, service technicians and VARs know exactly what's happening inside the mysterious world of IRQs, DMAs, power supply problems and hardware troubleshooting. KickStart IRQ is the total solution for IRQ and installation headaches!

Eliminate IRQ and DMA woes. Stop wasting time! Nothing is more frustrating than trying to install a new add-in card. More times than not, the factory settings simply don't work with the existing system configuration. In no time at all, KickStart IRQ quickly and accurately tells you what IRQs and DMAs are currently being used. You'll know exactly how to set up any add-in card correctly, quickly and easily. Includes easy-to-use software that displays cur-



rent IRQ and DMA settings right on the screen.

Use the KickStart IRQ card for power monitoring and testing. Is your power supply draining your computer? A poorly performing power supply can cause serious damage. Use KickStart IRQ to measure the power on all four voltages to within 5%. If any are out of tolerance, the corresponding LED will light red.

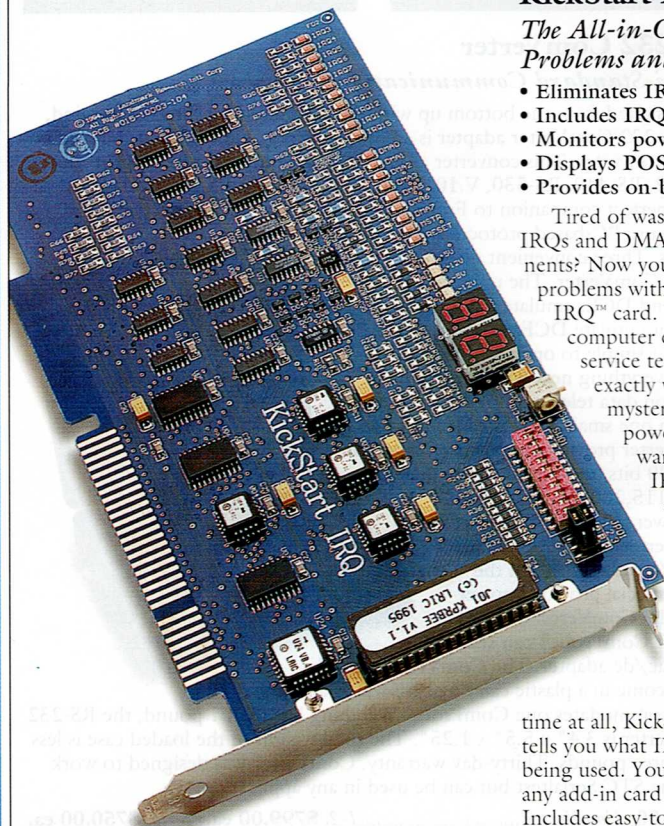
POST code test results. What do you do for a dead system? Kickstart it with KickStart IRQ! Every time a computer is booted, the POST or Power On Self Test is performed. When a test fails, KickStart IRQ will capture the test results and pinpoint exactly what the problem is. Then, simply refer to the manual for a complete description to troubleshoot the problem.

KickStart features on-board diagnostics. It includes on-board firmware to help diagnose and troubleshoot all major system components and subsystems. From the CPU and motherboard to exhaustive memory tests to analysis of hard drives, KickStart IRQ does it all. Pinpointing a hardware failure has never been easier. It's the perfect tool for troubleshooting systems when software diagnostics won't work or performing critical system burn-in.

System requirements: Intel 286-compatible or higher based personal computer; 256 KB RAM; 720 KB 3.5" disk drive; Hercules mono, CGA, EGA, VGA or higher video display.

KickStart IRQ

595X145 ... 1-5, \$319.00 ea.; 6-up, \$299.00 ea.



50 Series

Hand-Held Temperature Products

The remarkable 50 Series temperature products from Fluke offers a level of performance that's completely unprecedented. Every function is fully annunciated in large, easy-to-read digital displays, and what a selection of functions! Noise filtering helps eliminate rattling of the digit (common in most other units). Temperature conversion lets the user convert Fahrenheit to Centigrade with the touch of a button. Simply select either "K" or "J" for Thermocouple Choice. The hold function freezes any reading on the LCD. Self-test automatically performs diagnostics every time the unit is turned on.

Model 51 is the basic, single-input version. It can use any standard K- or J-type thermocouple probe that is capable of consistently delivering accurate measurements to $\frac{1}{10}$ of a degree. The 51 includes all the features described above and for the price, it is the best value available in the industry! Choose either the single-point or dual-point Model 52.

The 52 provides all the features of the 51 plus its own uniquely special capabilities. Min/Max records minimum and maximum temperatures from both inputs (or from their difference) which allows for unattended monitoring. Scanning can cycle continuously through T1, T2 and T1-T2 for efficient hands-off operation. Model 52's dual-point capabilities allow two inputs (T1 and T2) or their difference (T1-T2) to be monitored.

Each model comes complete and ready to use with batteries, 80PK-1 bead probe (two with the 52) and comprehensive instruction manual. A complete selection of additional thermocouple probes may be ordered separately.

50 Series Features

Temperature Range: -328° F to 2498° F
(-200° C to 1370° C)

Resolution: 0.1° C

Accuracy: 0.1% of reading

Thermocouples: K-type or J-type

Models: Single-point or dual-point

045X002 Model 51 Thermometer.....1-5, \$149.00 ea.; 6-up, \$142.00 ea.
045X003 Model 52 Thermometer.....1-5, 199.00 ea.; 6-up, 189.00 ea.
045X899 Optional C-50 Carrying Case.....18.00 ea.

Special Note: Nine different thermocouple probes are available for use with Model 51 and 52 Thermometers. Please refer to the Temperature Accessories section of this catalog for complete information and prices.

80PK-IR/80T-IR

Infrared Temperature Probes

These non-contact probes instantly and safely measure temperature where physical contact could be difficult or hazardous. The 80PK-IR emulates a Type K probe and works with any Type K digital thermometer or other device that accepts standard mini-connector inputs. Use Model 80T-IR with any digital multi-meter that has 10-M Ω

FLUKE



80PK-IR/80T-IR Features

Temperature Range: 0° to 500° F (-18° to 260° C)

Resolution: 1° C

Accuracy: $\pm 3\%$ of reading or $\pm 5^\circ$ F ($\pm 3^\circ$ C)

Response Time: 1-second

Repeatability: 1% of reading

Emissivity: fixed at .95

Analog Output: 1 mV per degree C or F (switchable)

input impedance and standard diameter banana jacks.

Fluke infrared temperature accessories provide accurate, repeatable, non-contact temperature measurements faster and easier than traditional contact methods. They are safe for use where the subject is electrically live, moving, hard to reach or easily contaminated by touch. Applications include pinpointing electrical hot spots and testing circuit board components.

Simple, one-handed operation makes troubleshooting quick and easy. Just plug the unit into the input jack. Select mV dc

range (for 80T-IR only). Then point the probe's tip at the object to be measured and shoot. It senses the amount of energy emitted from an object and converts it into a Fahrenheit or Centigrade digital temperature reading. Each easy-to-use probe has a

temperature range of 0° to 500° F (-18° to 260° C) with accuracy at 3% of the reading.

A standard 9-volt battery provides a typical life of 50 hours. Special sleep mode extends battery life by automatically shutting down after 10 minutes of continuous operation. Warning codes indicate when battery is running low, target temperature is out of range or probe is in warm-up or sleep mode. Includes quick reference card and step-by-step operating guide. Each 10-ounce charcoal black unit is 1.5" (W) x 7" (L). One-year warranty.

80PK-IR Thermocouple Probe

045X041..1-5, \$219.00 ea.; 6-up, \$208.00 ea.

80T-IR Temperature Probe

045X049.....1-5, \$219.00 ea.; 6-up, \$208.00 ea.



Raynger® ST™ Series

Low-Cost Noncontact Temperature Measurement Tools

- Spot heat and temperature change problems
- Rugged, simple and safe to use
- Accuracy and reliability in affordable portables

The Raynger® ST Series hand-held, battery-powered noncontact thermometers are compact, rugged and simple to operate. These everyday maintenance tools are easy for anyone to use without special training. They don't need focusing or calibrating. Simply aim, pull the trigger and read the temperature. Since you don't have to touch what you're measuring, temperatures of hazardous, hard-to-reach and moving materials can be taken without getting burned or shocked and without contamination. Rayngers are designed to be held away from the eye, so vision isn't blocked in dangerous environments.

ST Thermometers spot heat problems early in electrical and mechanical systems, machinery and equipment as well as help avoid costly repairs, downtime and ruined products. They are ideal for a variety of electronics uses including circuit board testing, wave soldering, solder reflowing and wafer polishing/coating. Use them to find hot spots in electrical connections, motors and bearings.

ST2L/ST4L Specifications

	ST2L	ST4L
Temperature Range	0° to 750° F (-18° to 400° C)	
Nominal D:S	8:1	
Accuracy	±2% of reading or ±3° F (±2° C)	
Repeatability	±1% of reading ±1 digit	
Response Time	500 ms	
Spectral Response	7 to 18 microns nominal	
MaxScan with Audible Alarm		✓
Recall Last Reading		✓
High Audible/Visual Alarm		✓
Emissivity	Pre-set 0.95	0.3 to 1.0 digitally adjustable
Temperature Display	1° F or °C switch selectable	
Ambient Operating Range	32° to 120° F (0° to 50° C)	



Proven circuitry assures accuracy and repeatability, even for targets as small as 1 inch (2.5 cm) in diameter. Rugged optics are environmentally sealed. You get measurements you can count on day after day, even in the harshest conditions. Raynger ST2L and ST4L measure temperatures from 0 to 750° F (-18° to 400° C). The ST4L also has an adjustable high or low audible/visual alarm, temperature recall, adjustable emissivity and MaxScan to track highest temperature measured.

Each black and gray Raynger ST is powered by a single 50-hour, 9-volt battery with low-battery indicator. LCD backlight reduces battery life. Includes instruction sheet. Each 9.5-ounce unit measures 5.4" x 1.6" x 7.7". One-year warranty.

ST2L Raynger ST

154X600.....1-5, \$199.00 ea.; 6-up, \$187.00 ea.

ST4L Raynger ST

154X644.....1-5, \$349.00 ea.; 6-up, \$328.00 ea.

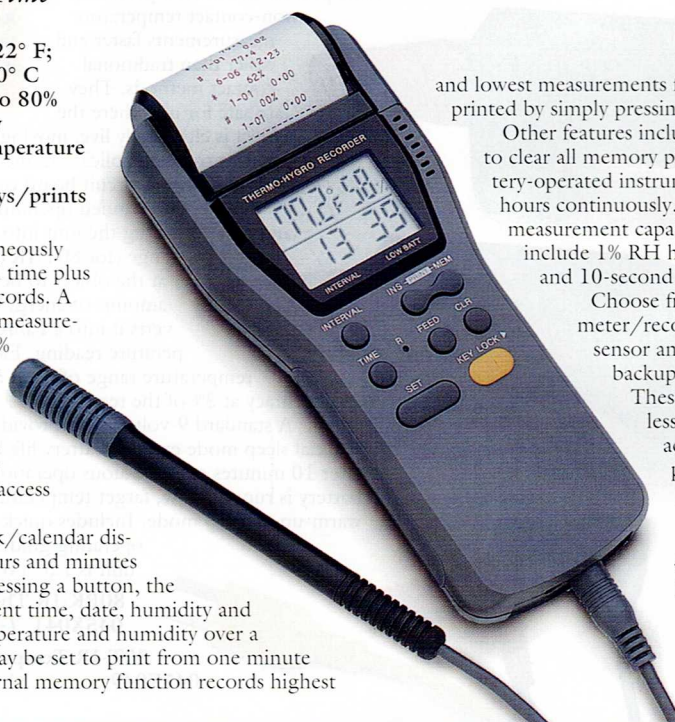
Thermo-Hygrometer/Recorders

Displays and Prints Temperature and Humidity with Real Time

- Measure 2% to 98% humidity
- F° version measures -40° to 122° F; C° version measures -20° to 50° C
- ±5% humidity accuracy @ 40 to 80% with ±2° temperature accuracy
- 1% RH humidity and 0.1° temperature resolution
- Built-in clock/calendar displays/prints hours/minutes, month/day

These portable meters simultaneously display temperature, humidity and time plus supply printouts for permanent records. A super large LCD provides instant measurements of relative humidity from 2% to 98%. The Fahrenheit model measures temperature from -40° F to 122° F while the Centigrade version measures from -20° C to 50° C. A 6-inch remote sensor with 3-foot cable provides access to hard-to-reach areas.

The instrument's built-in clock/calendar displays and prints real time with hours and minutes plus month and day. By simply pressing a button, the user can obtain a printout of current time, date, humidity and temperature. For monitoring temperature and humidity over a period of time, interval settings may be set to print from one minute to 99 hours and 59 minutes. Internal memory function records highest



EXTECH
INSTRUMENTS

and lowest measurements for both temperature and humidity which can be printed by simply pressing the MEM key.

Other features include key lock to prevent tampering, reset button to clear all memory plus low-battery and interval indication. This battery-operated instrument can run for 12 months intermittently or 20 hours continuously. A lithium backup battery ensures uninterrupted measurement capability during battery replacement. Specifications include 1% RH humidity resolution, 0.1° temperature resolution and 10-second sampling.

Choose from Fahrenheit and Centigrade versions. Each meter/recorder comes with a detachable RH/temperature sensor and 39-inch cable, paper roll, four AA batteries, backup lithium battery and vinyl pouch carrying case.

These meters measure 6.7" x 3.2" x 1.2" and weigh less than 9 ounces. One-year warranty. An optional ac adapter (117 V ac to 6 V dc) and replacement paper may be purchased separately.

445338 Meter/Recorder F° Version

160X4581-5, \$399.00 ea.; 6-up, \$368.00 ea.

445348 Meter/Recorder C° Version

160X4631-5, \$449.00 ea.; 6-up, \$414.00 ea.

160X447 445117 AC Adapter.....\$18.00 ea.

445399 Replacement Paper (5 rolls)

160X479.....\$12.00 ea.



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Humidity and Temperature Meter

- Centigrade/Fahrenheit switchable with recorder output
- RH readings of 10-95% with 0.1% RH resolution

This instrument combines a rugged Relative Humidity (RH) meter with a Centigrade/Fahrenheit switchable thermometer. Use it in a variety of clean air applications including office comfort, HVAC, fire and flood restoration. The thin-film capacitance sensor provides accurate humidity measurements ($\pm 3\%$) over a 10-95% RH range with a 0.1% RH resolution.

A built-in semiconductor sensor is used for temperature measurements of -20 to 60°C or -4 to 140°F with accuracy of 0.8°C/1.5°F. The built-in analog output jack provides a 10 mV/1% RH, 1°C/1°F output signal. A large 3.5-digit LCD also indicates function and low battery. The Data Hold feature holds the displayed value.

Measuring 10.6" x 2.7" x 1" in an attractive green case, the 4465CF meter weighs 7.1 ounces. It comes complete with carrying case, 9-volt (400-hour) battery and manual.

One-year warranty.

160X5654465-CF Meter
1-4, \$159.00 ea.
5-up, 147.00 ea.



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RH/Temperature Pen

- Simultaneously displays RH and temperature
- Min/max memory for both RH and temperature

This compact digital hygro thermometer is an exceptional value. It has a variety of applications in HVAC; computer areas; electronic assembly plants; clean rooms; food, paper and textile industries; drying rooms and greenhouses. A dual-display LCD simultaneously displays both Relative Humidity (25-95%) and temperature (32-122°F; 0-50°C). This pen-type digital meter is switchable for either Centigrade or Fahrenheit display of readings. The Min/Max memory feature functions for both measurements.

The 3-ounce 4458CF is 5.5" x 1.2" x 1". Includes two 1.5-V batteries, belt clip, pouch case and instructions. Six-month warranty.

160X538 4458-CF RH/Temperature Pen ..1-4, \$49.00 ea.; 5-up, \$45.00 ea.
160X390 409990 Slim Vinyl Pouch Carrying Case10.00 ea.

Thermocouple Calibrator

- New mV or °F/°C indication of output
- Microprocessor version
- Input/output for measurement/calibration of eight thermocouple types
- 0.15% accuracy over wide ranges with 0.1° resolution
- Fahrenheit, Centigrade switchable

This calibrator plus thermometer is a microprocessor version. It provides precision and convenience equal to more expensive calibrators. Calibrate thermometers and measure thermocouple Type J, K, T, E, C, R, S and N devices. High-accuracy calibration function simulates precision thermocouple outputs for calibrating thermometers, transmitters, controllers or recorders. Calibration cable connects meter to other thermocouple devices. Simply adjust output knob to display desired temperature and calibrate your instrument to its accuracy specification.

Versatile thermometer function displays temperatures over wide ranges. It switches from Fahrenheit to Centigrade for increased versatility in measure and calibrate modes. Bright four-digit LED display features sensor-type indication. It displays temperature and thermocouple type. Calibration and measure modes range from 58° to 830°F (-50° to 1370°C) for Type J to 58° to 2372°F (-50° to 1300°C) for Type N with 0.15% accuracy. Measure voltage from -5 mV to 55 mV with 10 μ V ± 1 digit accuracy.

Unique oyster case design features large digital display built into flip-up cover which adjusts from 90° to 180° for best viewing angle. It automatically shuts off when closed. Portable, rugged industrial design provides battery or ac operation for field, plant or benchtop use. This 115-V ac instrument includes 5-foot thermocouple calibration cable with molded subminiature connectors, ac adaptor/recharger, 9-volt rechargeable battery and neckstrap for hands-free operation. The 2-pound navy-colored unit is 3.8" x 4.2" x 1.8" folded. One-year warranty.

160X419 433201 Calibrator1-5, \$299.00 ea.; 6-up, \$275.00 ea.



Stem Thermometers

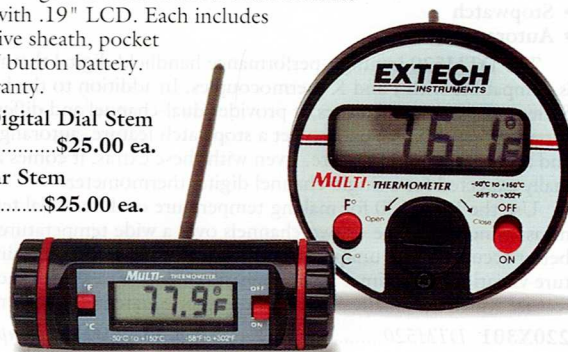
- Centigrade to Fahrenheit switchable
- High resolution to 0.1° with $< 2^\circ$ F/1° C accuracy

Multi-Thermometers are designed for applications where conventional bi-metal dial pocket thermometers have been used. They are ideal for use in liquids and semi-solids. Measurements are made via a 5" stainless steel thermistor probe. Wide measuring range is -58 to 302°F and -50 to 150°C. Resolution is .1° to 199.9 and 1% over 200°. Accuracy is $< 2^\circ$ F/1° C. On/off switch saves battery life.

Choose from two models. The 392050's 2-inch diameter dial head features a large .4" digital LCD. Model 392050 features a T-bar head with .19" LCD. Each includes plastic protective sheath, pocket clip and 1.5-V button battery. One-year warranty.

392050 2" Digital Dial Stem
160X270\$25.00 ea.

392065 T-Bar Stem
160X275\$25.00 ea.



Tektronix

DTM500 Series Handheld Digital Thermometers

- Each intuitive user interface is packaged in an affordable DTM
- Measurement hold and record maximum functions standard

Service professionals choose Tektronix for easy-to-use digital thermometers that are also affordable. The rugged DTM500 Series contains compact, battery-powered DTM520 and DTM510 models. Each utilizes an intuitive layout for easy access to all functions and includes measurement hold. Use the record maximum feature to capture extreme temperature measurements. Whether you work in process control, HVAC-R or food engineering, high-quality performance and environmental durability are attractively priced.

Choose from two models, each with 9-volt battery, holster and manual. Two ATP01 bead probes come with DTM520. The DTM510 contains one probe. Each 15.2-ounce meter is 6.7" x 2.9" x 1.5". Three-year warranty.

Model DTM520

Two-Channel Digital Thermometer

- Temperature range from -200° C to +1370° C
- $\pm(0.1\% + 0.7^\circ \text{C})$ basic accuracy
- Dual-channel temperature measurements
- Differential temperature measurements
- Stopwatch
- Autoranging

The DTM520 is a high-performance handheld digital thermometer that is compatible with J and K thermocouples. In addition to the basic DTM500 Series measurement features, it provides dual-channel and differential measurement capability. You also get a stopwatch feature, autoranging capability and record minimum feature. Even with these extras, it comes at a price normally expected for a single-channel digital thermometer.

Use the DTM520 for making temperature or differential temperature measurements on one or two channels over a wide temperature range with better accuracy. The unique stopwatch feature simplifies tracking temperature variations over time. Taking measurements is easy with the autoranging feature which automatically selects the appropriate measurement range.

220X301 DTM520.....1-5, \$149.00 ea.; 6-up, \$143.00 ea.

NEXT-DAY DELIVERY
ONLY \$14.95!



DTM500 Series Specification Comparison

	DTM520	DTM510
Channels	Two	One
Thermocouples	J or K	K
Accuracy		
Single Input	$\pm(0.1\% + 0.7^\circ \text{C})$	$\pm(0.3\% + 1^\circ \text{C})$
T1-T2	$\pm(0.1\% + 2^\circ \text{C})$	
Resolution ($^\circ \text{C}$)	0.1/1	0.1/1
Minimum Temperature	-200° C	-50° C
Maximum Temperature	+1370° C	+1300° C
Measurement Hold	✓	✓
Record Maximum	✓	✓
Record Minimum	✓	
Differential (T1-T2)	✓	
Autoranging	✓	
Stop Watch	✓	
9-Volt Battery	✓	✓
Holster	✓	✓
ATP01 Bead Probes	Two	One



Model DTM510

One-Channel Digital Thermometer

- Temperature range from -50° C to +1300° C
- $\pm(0.3\% + 1^\circ \text{C})$ basic accuracy

Model DTM510 is an entry-level, battery-powered digital thermometer in a compact, water- and dust-resistant case. This easy-to-use, single-channel meter with K-type thermocouples provides the basic DTM500 Series features. Make it your primary solution for basic temperature measurements.

220X299 DTM510.....1-5, \$99.00 ea.; 6-up, \$95.00 ea.

Specialized Products Company Certificate of Calibration

Fluke Corporation in association with Specialized Products Company certifies that the above listed instrument meets or exceeds all published specifications. It has been calibrated using standards whose accuracies are traceable to the National Institute of Standards and Technology (NIST). Alternatively, accuracies have been derived by the ratio type of self-calibrated techniques. All calibration activities are performed in compliance with MIL-STD-45662A.

Calibration Data

Temperature: 23.0 °C
Humidity: 45%

Tech#: 142
Order Number: 123456



Specialized Products Company
3131 Premier Drive
Irving, Texas 75063

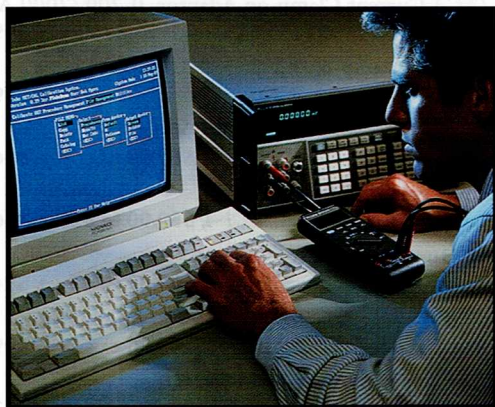
Calibration Program for Fluke Meters Certificate of Calibration Ensures Accuracy

- Maximize meter reliability
- Two-day calibration service
- Traceable to MIL-STD-45662A and NIST
- Includes certification document, label and seal

For years SPC has proudly distributed Fluke's high-quality line of electronic test equipment. New services are now available to maximize the return on your investment. For a small additional charge, SPC will ensure the productivity of your new meter by providing a traceable calibration. With select Fluke models, you will receive a Certificate of Calibration, label and tamper-resistant sticker.

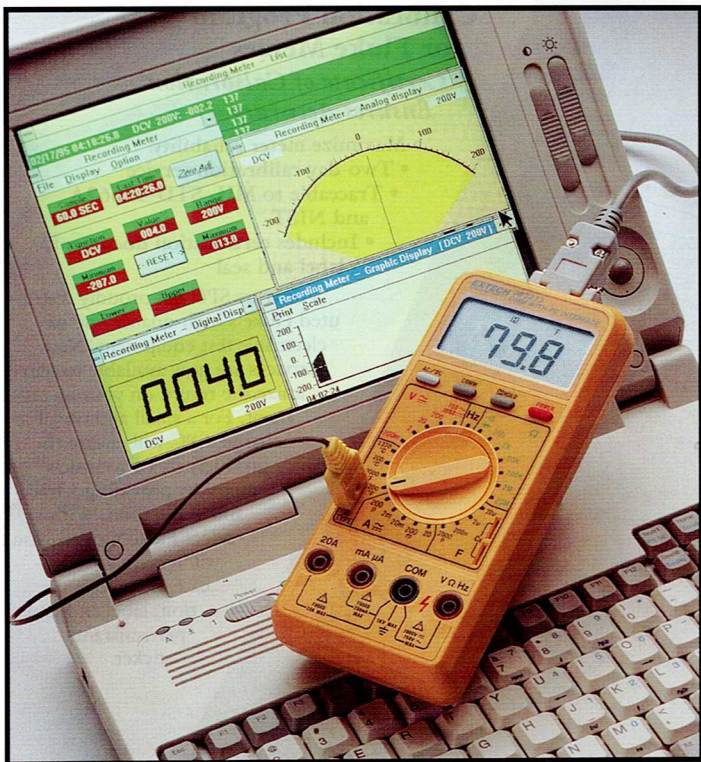


A full-sized Certificate of Calibration is your guarantee that the instrument has a one-year calibration cycle performed under ISO 9001 controlled processes in compliance with MIL-STD-45662A. (Longer manufacturer warranties are not affected.) Your new meter is certified to meet or exceed all published specifications with accuracies traceable to the National Institute of Standards and Technology (NIST). The Instrument Calibration Label, affixed to your instrument, indicates the meter's serial number, date of the calibration and date when the next calibration is due. A Calibration Seal, also affixed to your instrument, guards against tampering. SPC's Calibration Program assures the continued reliability of your Fluke meter.



Stock No.	Model No.	Description	Page	Regular Price	Price with Certificate
045X183C	83	Digital Multimeter	106	\$ 265.00	\$ 305.00
045X185C	85	Digital Multimeter	106	305.00	345.00
045X187C	87	True-rms DMM	106	335.00	375.00
044X140C	70	Economic DMM	104	89.00	114.00
045X004C	73	DMM w/ 10-A Current	104	109.00	136.00
045X007C	76	Hand-Held DMM	105	199.00	231.00
045X008C	77	Hand-Held DMM	105	179.00	206.00
044X160C	79	DMM w/ Cap., Freq.	105	199.00	231.00
045X155C	23	Industrial Yellow DMM	105	179.00	206.00
045X125C	29	Yellow Case DMM	105	199.00	231.00
045X820C	8060A	4.5-Digit DMM	107	459.00	496.00
045X825C	8062A	4.5-Digit DMM	107	389.00	426.00
044X052C	45-01	Dual-Display DMM	107	809.00	841.00
044X203C	92B	ScopeMeter	165	1490.00	1620.00
044X211C	96B	ScopeMeter	165	1790.00	1920.00
044X224C	99B	ScopeMeter	165	2190.00	2320.00
044X231C	105B	ScopeMeter	164	2590.00	2720.00
045X002C	51	Digital Thermometer	95	149.00	181.00
045X003C	52	Dual Thermometer	95	199.00	239.00





Models 383273 and 383274

Multimeter/Data Acquisition Datalogging Systems

- Large 1999-digit display
- Data hold
- Overload warning
- Built-in RS-232C serial interface (standard D9 connector) with optical isolation to prevent damage to computer
- New Model 383274 with built-in datalogging function comes complete with transfer software

These Extech multimeters feature a built-in optically isolated RS-232 serial interface plus Data Acquisition Software which runs on Microsoft Windows™. Simply connect a multimeter's RS-232 port to available serial port on the PC, select the measurement on the multimeter you wish to monitor and attach test leads to the device being monitored. The easy-to-use Windows-based software lets you set up timing sequences for automatically collecting data, multiple windows (analog meter, graph, digital display, data list) and audible HI/LO alarms. Data displayed on the PC can be saved as an ASCII file which can be brought into Lotus, Excel or other graphing and data presentation programs.

In addition to all the standard functions of the 383273, the new 383274 has a built-in datalogger which stores 4048 readings. It also can capture and store DMM measurements and transfer them to a PC via the datalogger. Other features include a Go-No Go digital signal output jack for QC and industrial automation. Software is included to configure the multimeter (function, time sequences) and to transfer stored data to a PC.

Monitor temperature, humidity, rpms, light level or ac/dc current simply by plugging one of Extech's optional Measurement Adaptors into either multimeter. These battery-operated adaptors connect to multimeter voltage and common sockets for direct display in appropriate engineering units.

383273/383274 Specifications

Measurement	Ranges	Accuracy as % Reading
DC Voltage	200 mV, 2 V, 20 V, 200 V, 1000 V	±0.5%+1d
AC Voltage	200 mV, 2 V, 20 V, 200 V, 750 V	±1%+3d
DC Current	200 µA, 2 mA, 20 mA, 200 mA, 20 A	±1%+1d (200 mA); 1.2% (20 A)
AC Current	200 µA, 2 mA, 20 mA, 200 mA, 20 A	±1.2%+3d (200 mA); 1% (20 A)
Resistance	200 Ω, 2 kΩ, 20 kΩ, 200 kΩ, 20 MΩ	±0.8%+2d (to 2 MΩ)
Frequency	2 k, 20 k, 200 k, 2 M, 20 M	±0.5%+3d
Capacitance	2000 pF, 200 nF, 2 µF, 20 µF	±3%+10d
Temperature	-50.1 to 199.9° C/-50 to 1000° C (Type K)	±0.5%+2° C/1%+2° C
Diode Test and Continuity Test	Audible tone if <30 Ω	±0.5%+3° F/1%+4° F
Sampling Time	2.5 readings per second	

EXTECH
INSTRUMENTS

383273/383274 Monitor and Record

- | | |
|---|---|
| <ul style="list-style-type: none"> • AC/DC Voltage • AC/DC Current • Frequency • Capacitance • Resistance • Temperature °F/°C | Using Optional Adaptors: <ul style="list-style-type: none"> • Current Via Clamp-on • Airflow (ft./min, m/s) • Humidity (%RH) • Light Level (fc/lx) • RPMs |
|---|---|

Both complete systems include multimeter with built-in stand, spare fuse, 9-volt battery, type K temperature probe, test leads, Data Acquisition Software, RS-232 serial cable terminated with D-9F connector and hard carrying case. Each 12-ounce unit is 7.5" x 3.2" x 1.5". One-year warranty.

383273 Multimeter/Data Acquisition Datalogging System

160X225 1-5, \$199.00 ea.; 6-up, \$183.00 ea.

383274 Multimeter/Data Acquisition with Built-in Datalogger

160X230 1-5, \$399.00 ea.; 6-up, \$367.00 ea.

Optional Measurement Adaptors

380904 DCA/ACA Current Clamp-on Adaptor, 0-200/400 A
160X124 1-5, \$89.00 ea.; 6-up, \$82.00 ea.

380905 DCA/ACA Current Clamp-on Adaptor, 0-200/2000 A
160X125 \$99.00 ea.

380906 ACA Current Clamp-on Adaptor, 0-1000 A
160X126 \$39.00 ea.

401020 Lux Adaptor, Three Ranges, 0-50,000 Lx
160X320 1-4, \$59.00 ea.; 5-up, \$56.00 ea.

401021 Footcandle Adaptor, 0-5000 Fc
160X322 1-4, \$59.00 ea.; 5-up, \$56.00 ea.

445602 Relative Humidity Adaptor, 15-90%
160X502 1-4, \$99.00 ea.; 5-up, \$94.00 ea.

461900 Photo Tachometer Adaptor, 100-19990 rpm
160X700 1-4, \$109.00 ea.; 5-up, \$99.00 ea.

451212 Vane Anemometer Adaptor, 80-5910 fpm
160X642 1-4, \$129.00 ea.; 5-up, \$123.00 ea.



True-RMS Multimeter with Probe

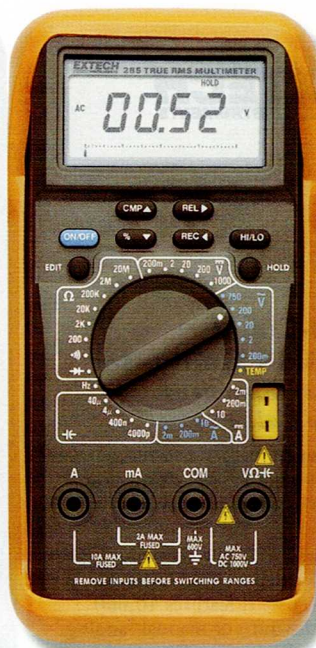
Programmable and Packed with Features

- Measures frequency, capacitance and temperature
- 0.05% basic dc voltage accuracy
- F° to C° temperature function

Model 380285 is a programmable true-rms DMM that offers every feature the most discerning engineer could want. It has a 4.5-digit LCD, 20,000 counts, manual ranging, 0.05% basic dc accuracy and 42-segment analog bar graph.

Modes include zoom, edit, relative, compare, REC and percentage. Features include Max-Min recording/recall, Diode Test, Data Hold, audible continuity test, auto power off, overload protection and Fahrenheit to Centigrade temperature function.

This 1-pound DMM measures 7.3" x 3.3" x 1.2". The stand for benchtop use can be wall mounted. Includes test leads, temperature probe, snap-on holster, 9-V battery and users manual. One-year warranty.



380285 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	10 μ V-1 kV
Voltage (ac)	5	10 μ V-750 V
Current (dc/ac)	3	0.1 μ A-10 A
Resistance (Ω)	6	0.01-20 M Ω
Capacitance	4	0.001 nF-20 μ F
Frequency	2	1 Hz-200 kHz

160X085 380285 True-RMS Meter1-5, \$199.00 ea.; 6-up, \$183.00 ea.
160X397 409997 Optional Vinyl Pouch Carrying Case19.00 ea.

Heavy-Duty Phase Indicator MultiMeter

Three-Phase Power Indicator

- Multi-function multimeter
- Large 3.5-digit display
- Performs audible continuity and diode tests

This three-phase power indicator for motors is built into a digital multimeter with frequency and temperature functions. The 380224 features a large 3.5-digit display. Functions include dc V, ac V, capacitance, frequency, temperature and phase sequence. Phase indicator identifies correct or incorrect wiring configuration via direction of arrow on display. It performs audible continuity and diode tests.

The 12-ounce unit measures 5.7" x 2.7" x 1.5". A built-in stand is provided for benchtop use. Unit comes complete with rubber holster with wrist strap, color-coded test leads for phase, alligator clips, multimeter test leads, temperature probe and 9-volt battery. Provides low-battery indication (200 hours typical). UL 1244 listed. An optional vinyl pouch carrying case is available separately. One-year warranty.



380224 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	4	2-600 V
Voltage (ac)	2	200-600 V
Resistance (Ω)	8	200-2000 M
Capacitance	4	20 μ -20 mF
Frequency	2	10 Hz-100 kHz (autoranging)
Temperature		-4° to 752° F (-20° to 400° C)
Phase Indicator		45-450 Hz, 80-480 V ac

160X069 380224 Phase Indicator1-5, \$79.00 ea.; 6-up, \$73.00 ea.
160X158 380995 Optional Vinyl Pouch Carrying Case10.00 ea.

EXTECH
INSTRUMENTS

Mini Digital MultiMeter

Ideal Choice for a Basic DMM

- Compact yet rugged model
- Large 3.5-digit LCD
- Select from seven functions

The Mini Digital MultiMeter is compact and lightweight yet rugged enough for field use. Model 380602 features a large 3.5-digit LCD with a maximum reading of 1999.

An easy-to-use rotary selection switch allows you to select ranges within seven functions. They include dc/ac voltage, dc current, resistance, diode, transistor and audible continuity tests. This meter also provides polarity, overload and battery indication. The sampling rate is 2.5 times per second. To obtain measurements, just plug the red test lead to + connector and black test lead to - connector.

This 6-ounce unit measures a compact 4.5" x 2.75" x 1.75". Use the handy built-in tilt stand for benchtop placement. The hanger can be used for convenient belt, work belt or wall mounting. Includes test leads, spare fuse, 200-hour 9-volt battery and operating instruction manual. A vinyl pouch carrying case may be purchased separately. One-year warranty.



380602 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	4	2-1000 V
Voltage (ac)	2	200-750 V
Current (dc)	3	2-200 mA
Resistance (Ω)	6	200-20 M

160X108 380602 Mini DMM1-5, \$39.00 ea.; 6-up, \$36.00 ea.
160X392 409992 Optional Vinyl Pouch Carrying Case10.00 ea.

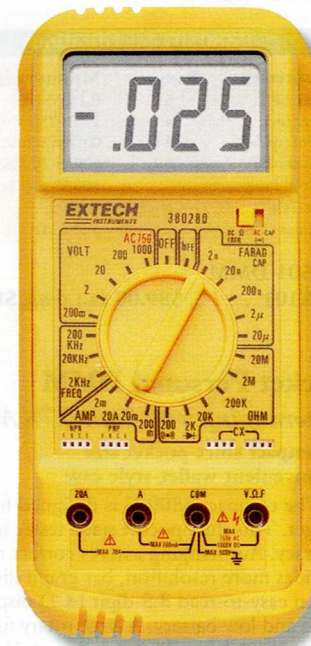
Rangemaster

Nine-Function MultiMeter

- Heavy-duty model
- New super large .95-inch LCD
- Large 3.5-digit display

Extech's Model 380280 is a heavy-duty multi-function model. It offers a super large .95-inch LCD with a large easy-to-read 3.5-digit display. The Rangemaster's many features include dc/ac current measurements to 20 A, transistor test, diode check and audible continuity at 4 kHz. This multimeter also provides full overload protection, low battery and overrange indication.

The Rangemaster weighs only 11 ounces and measures 3.5" x 7.5" x 1.4". It comes complete with rubber protective holster and stand, test leads and 9-volt battery. An optional vinyl pouch carrying case is available separately. One-year warranty.



380280 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	200 mV-1000 V
Voltage (ac)	5	200 mV-750 V
Current (dc/ac)	4	2 mA-20 A
Resistance (Ω)	6	200-20 M
Capacitance	5	2 nF-20 μ F
Frequency	3	2 kHz-200 kHz

160X086 380280 Rangemaster DMM1-5, \$79.00 ea.; 6-up, \$73.00 ea.
160X396 409996 Optional Vinyl Pouch Carrying Case15.00 ea.



Autoranging Multimeter

20-Amp Current Range with 0.5% dc Accuracy

- Extra-large display
- Provides six functions
- Overload protection

This rugged 3.5-digit autoranging DMM offers six functions. The 380501 measures ac and dc voltage and current, resistance and diode check. It also features audible continuity with a buzzer below 620 Ω .

The low-cost DMM offers a super-large .77-inch LCD. This display provides clear readings of measurements with automatic polarity and low-battery indication. Features include auto and manual range selection, 20-amp current range, overload indication (protected to 500 volts) plus Data Hold to freeze the displayed value.

Small enough to fit in the palm of your hand, the rugged design is tough enough for industrial field applications. It comes complete with a built-in tilt stand, test leads, two 1.5-V AA (100-hour) batteries, carrying case and user's manual. It weighs 10 ounces and measures 5.5" x 3" x 1.5". One-year warranty.

380501 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	0.1 mV-1 kV
Voltage (ac)	4	1 mV-750 V
Current (dc/ac)	3	0.01 mA-20 A
Resistance (Ω)	6	100 Ω -20 M Ω
Overload Protection		500 V dc or ac
Diode Test		1 mV-2 V
Continuity Test		1 Ω -2 k Ω

380501 DMM

160X1011-5, \$89.00 ea.; 6-up, \$83.00 ea.

Pocket Personal DMM

Autoranging with Basic 0.7% Accuracy

- Compact shirt-pocket size
- Convenient wallet-style case

The compact 380933 is designed for the test technician or student on a limited budget. This shirt-pocket sized tester features 3200-count autoranging 0.7% basic accuracy. Autoranging assures correct range and avoids overloads. Model 380933 provides more resolution, bar graph display, data hold and audible continuity.

An easy-to-read 3.5-digit LCD displays function, unit, polarity, decimal, over-range and low battery. A large rotary function selector dial easily indicates the five functions available for measurement: Volts ac, Volts dc, Resistance, Continuity and Diode Check. Diode Check makes diode cut-in voltage measurement. The Continuity function has an audible beeper at approximately 280 Ω . It is convenient for making wiring checks without having to watch the meter to verify the connection.

380933 Specifications

Measurement	Ranges	Measurement Ranges
Voltage (dc)	Auto	300 mV-450 V
Voltage (ac)	Auto	3 V-450 V
Resistance (Ω)	Auto	300 k-30 M
Continuity		Audible buzzer

160X148 380933 Pocket DMM1-4, \$39.00 ea.; 5-up, \$36.00 ea.

EXTECH
INSTRUMENTS

40,000-Count True-RMS Multimeter Advanced Functions Increase Value

- Measures humidity and temperature
- Features $\pm 0.1\%$ basic dc accuracy
- Drop-proof design with rubber holster

This precise, heavy-duty multimeter offers a host of advanced functions, yet it is easy to use. It features 40,000 counts and is auto or manual ranging. The bright display is easy to read.

Increased digits provide greater resolution. Autoranging offers best resolution and ease. Model 380250-K measures ac and dc voltage and current, resistance,

capacitance and frequency. With the included probe, it also measures humidity and temperature.

Auto-Hold beeps and keeps voltage, current or resistance measurement on display. Use the handy null function when measuring resistors. Press REL to zero reading. The difference from reference point will be displayed. Bar graph will display up/down from center point. An audible alarm can be set up to turn on whenever bar graph returns to center point (displays 000 in REL). Auto power off is a default condition and can be easily disabled by pressing the Min/Max key before turning the meter on. Min/Max mode records and recalls readings on all functions except for diode test.

The 380250-K True-RMS DMM/Humidity/Temperature Kit comes complete with relative humidity and air temperature probe, test leads, 9-volt battery and case. The 6-foot drop-proof design includes a snap-on protective rubber holster to absorb shocks. It features a flexible stand for benchtop use or can be hung from a pipe. The 380245 True-RMS Multimeter includes test leads, battery and holster. Each 14-ounce unit is 7.6" x 3.4" x 1.5". One-year warranty.

160X083 380250-K DMM/Humidity/Temperature Kit1-5, \$199.00 ea.; 6-up, \$187.00 ea.

160X080 380245 True-RMS DMM1-5, 149.00 ea.; 6-up, 140.00 ea.

160X081 380245-N NIST Certificate for True-RMS DMM70.00 ea.



380250-K Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	0.01 mV-1000 V
Voltage (ac)	5	0.01 mV-750 V
Current (dc/ac)	2	0.01 mA-10 A
Resistance (Ω)	6	0.01 Ω -40 M Ω
Capacitance	3	0.001 nF-99.99 μ F
Frequency	3	1 Hz-199.999 kHz
		Min. Sensitivity 40 mV (min 10 V >100 kHz)
Temperature		0-50° C (32-122° F) TM

EXTECH
INSTRUMENTS



NEXT-DAY DELIVERY
ONLY \$14.95!



Series 10 Fluke 12 FLUKE

The Only Hand-Held DVM with Time Stamp™

- Min/Max recording with Time Stamp™
- Exclusive Continuity Capture™
- Time-saving V Chk™
- 4000-count digital display
- Basic dc V accuracy: 1.5% (10), .9% (11, 12)
- Basic ac V accuracy: 2.9% (10), 1.9% (11, 12)
- Basic Ω accuracy: 1.5% (10), .9% (11, 12)

Series 10's top-of-the-line Model 12 offers incomparable troubleshooting features. This versatile meter quickly and easily performs continuity and diode tests. It features a full 4000-count autoranging display, high-speed continuity beeper and battery-saving sleep mode.

An elapsed time clock stamps Min/Max voltage readings to the nearest minute for up to 100 hours. Continuity Capture™ activates the recording feature to capture intermittent opens and shorts as brief as 250 μ s. You can connect the Fluke 12, walk away and check the symbolic display later to discover what condition happened and when.

V Chk™, an extension of the ohms/continuity function, measures power sources and supplies. It displays correct voltage as well as open/short circuits and when voltage is greater than 4.5. Input impedance is lowered from 10 M Ω to a minimum of 2 k Ω to distinguish between real voltage and leakage from other sources.

This popular meter comes complete with batteries, standard test lead set and extensive operations manual. The 10-ounce unit measures 1.4" x 2.8" x 5.6". Two-year warranty.

Model 12 DVM

044X0251-9, \$95.00 ea.; 10-up, \$89.00 ea.



Series 10 Specifications

Measurement	Measurement Range	Resolution
Voltage (dc)	4 V-600 V	1 mV
Voltage (ac)	4 V-600 V	1 mV
Resistance (Ω)	400 Ω -40 M Ω	.1 Ω
Capacitance (Models 11 and 12 only)	1 μ F-10,000 μ F	.001 μ F
Diode/Continuity	0.001 V-2 V	

Series 10 Fluke 11

V Chk™ Saves You Time Every Time

This mid-range meter is designed to troubleshoot most electrical problems quickly by speeding through continuity and voltage checks. The Fluke 11 includes V Chk™, an ingenious time-saver for measuring power sources and supplies. It is built to withstand a lifetime of wear and tear. Model 11 measures capacitance values from .001 to 9999 μ F. Two-year warranty. Accessories available separately.

Model 11 DVM

044X0221-9, \$79.00 ea.; 10-up, \$76.00 ea.

Series 10 Fluke 10

The Lowest Priced Fluke Meter

The basic Fluke 10 combines an optimum set of troubleshooting features to locate hard faults and do first-round checks. This versatile yet affordable meter performs continuity and diode tests with speed and easy, automatic operation. Designed for true one-handed operation, just turn on the slide switch and use two push-buttons to switch functions and ranges. The sleep mode automatically beeps and turns off the display to extend battery life. Two-year warranty. Accessories available separately.

Model 10 DVM

044X0201-9, \$69.00 ea.; 10-up, \$66.50 ea.

Series 10 Accessories

C-12A Deluxe Carrying Case

044X612\$12.00 ea.

C-10 Rubber Holster (Yellow)

044X610\$12.00 ea.

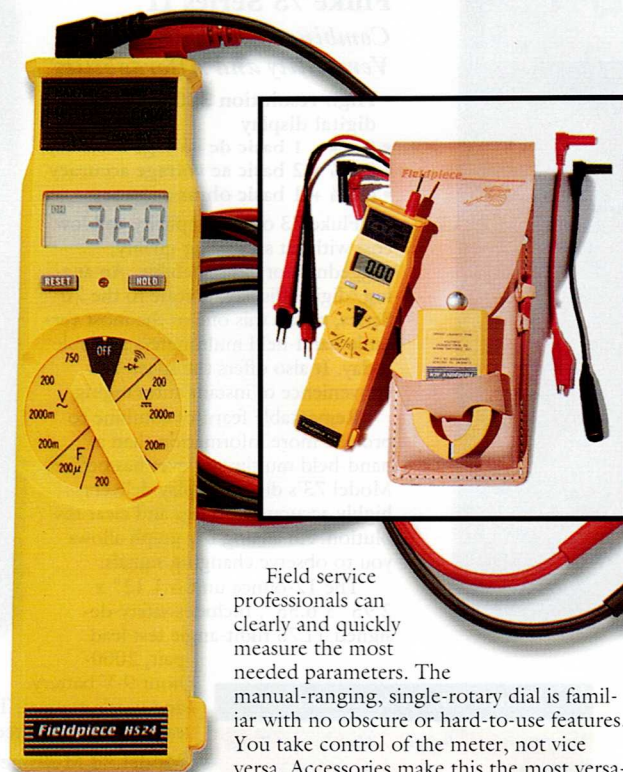
Stick DMM

Heavy-Duty Leather Fieldpack

This professional-grade field-service meter functions as a DMM, Wiggy™, Amprobe™ and capacitance meter in one easy-to-carry instrument. The most popular feature is the ACH clamp head that attaches directly to the unique stick-style meter. Together they provide maximum overall accuracy of 300 A ac with a resolution of 0.1 A and accuracy of 2.4% + 3 @ 60 Hz and 5% + 10 to 1 kHz.

The high-impact, fire-retardant yellow Valox case is built tough to withstand a 10-foot drop to concrete. It is fully "O" ring sealed against dirt and grime. The rugged MOVs and PTCs withstand accidental industrial-grade electrical overloads that would result in damage to other meters.

Manual ranging, a continuity beeper and display hold make the HS24 stick-style meter easy to use. A loud beep and LED provide increased safety by warning the user of dangerously high voltages. With the hold button and alligator clips, the user can easily make safe one-handed tests while keeping an eye on the test point.



Field service professionals can clearly and quickly measure the most needed parameters. The manual-ranging, single-rotary dial is familiar with no obscure or hard-to-use features. You take control of the meter, not vice versa. Accessories make this the most versatile measurement tool a service technician can use. It measures volts, amps, ohms and capacitance. The 9-volt battery has a 300-hour life. A built-in circuit automatically turns the meter off after one hour of non-use.

This kit includes the HS24 stick-style DMM, ACH clamp head, deluxe test lead set and a set of long probe-type tips — all contained in a deluxe leather, holster-type case. The 1-pound meter measures 7.2" x 1.9" x 1". Two-year warranty.

Fieldpiece

HS24K11 Specifications

Measurement	Range
Voltage (dc)	200 m, 2000 m, 20, 200
Voltage (ac)	200 m, 2000 m, 200, 750
Ohms	2 K
Farads	200 μ

HS24K11 Complete DMM Kit

773X800 ..1-5, \$159.00 ea.; 6-up, \$149.00 ea.

HS24 Stick-Style DMM Only

773X7501-5, \$99.00 ea.; 6-up, \$93.00 ea.

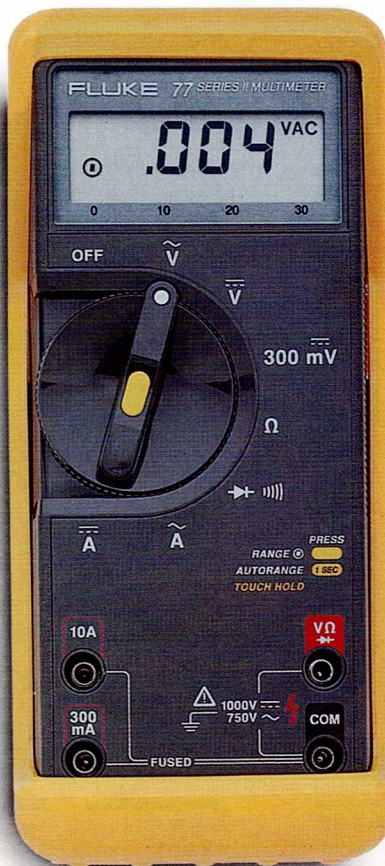


70 Series II Analog/Digital Multimeters

Fluke's 70 Series makes more measurement capability more affordable. Each model features a single push-button and rotary dial to select all functions, auto and manual ranging plus automatic polarity selection. Battery-saving sleep mode automatically powers down display if you forget to turn it off. All inputs including 10 A are protected.

Specially designed Fluke 70 Series II features include automatic Touch Hold®, audible continuity/diode testing, fast autoranging and range hold plus analog/digital display.

Use **Automatic Touch Hold** for safe, convenient hands-free operation. Automatically captures stable readings. Signals measurement with beep and locks it in display until you're ready to view it. **Audible Continuity/Diode Test** function provides audible tone for fast continuity check. For testing diodes, a brief tone indicates voltage drop of less than 0.7 V, the typical drop for silicone diode passing about 500 μ A.



FLUKE

Fast Autoranging automatically selects range with greatest accuracy and resolution for any function. The meter places the decimal point for easy readout. **Range Hold** locks in specified ranges, speeding up repetitive go-no-go checks. Each 70 Series meter includes Fluke's unique **Analog/Digital Display**. The high-resolution, 3200-count digital display delivers better accuracy than conventional 3.5-digit DMMs. A 31-segment bar graph reacts 10 times faster than numerical display, making peaking and dipping adjustments easy.

Each meter has a three-year warranty. Optional accessories include holster and case, each with a one-year warranty. The snap-on Rubber Holster C70Y absorbs shocks and protects meter from rough handling. Unique **Flex-Stand™** lets meter hang, lean or stand. Belt hook and lead/probe storage are on the back. The C50 Compact Soft Case holds any 70 Series II meter without its holster plus the manual and leads ready for testing. The vinyl case comes with a belt loop.

Fluke 70 Series II Fluke's Lowest Cost Meter Offers Exceptional Performance

- High-resolution 3200-count digital display
- 0.5% + 1 basic dc voltage accuracy
- 2.0% + 2 basic ac voltage accuracy
- 0.5% + 1 basic ohms accuracy

Model 70 is the most affordable member of Fluke's 70 Series II, but you still get excellent performance and rugged design. This simple-to-use meter measures volts, ohms and diodes with single selection of all functions.

It offers more features than you would expect from an entry-level DMM. A high-resolution digital display provides better accuracy than conventional 3.5-digit DMMs. Automatic Touch Hold not only captures measurements but also automatically updates with each new reading to eliminate resetting.

This 12-ounce unit is 1.12" x 2.95" x 6.55". Includes safety-designed TL75 right-angle test lead pair, 2000-hour 9-volt battery and operator's manual. Three-year warranty with one-year calibration guarantee.

Model 70 Multimeter

044X140	1-5, \$89.00 ea.; 6-up, \$85.00 ea.
C-70Y Rubber Holster (Yellow)	
045X910	\$18.00 ea.
C-50 Compact Soft Case	
045X899	\$18.00 ea.

Fluke 73 Series II Combines Simplicity, Versatility and Affordability

- High-resolution 3200-count digital display
- 0.4% + 1 basic dc voltage accuracy
- 2.0% + 2 basic ac voltage accuracy
- 0.5% + 1 basic ohms accuracy

Fluke 73 offers simplicity and low cost without sacrificing quality, ruggedness or dependability. An analog/digital display, unique to the 70 Series, makes this one of the most versatile hand-held multimeters available today. It also offers the speed and convenience of instant autoranging.

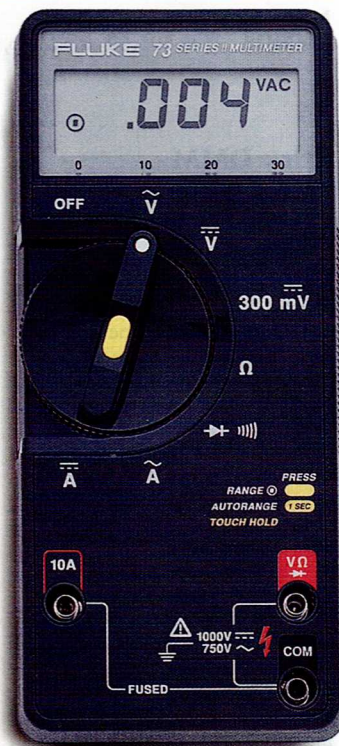
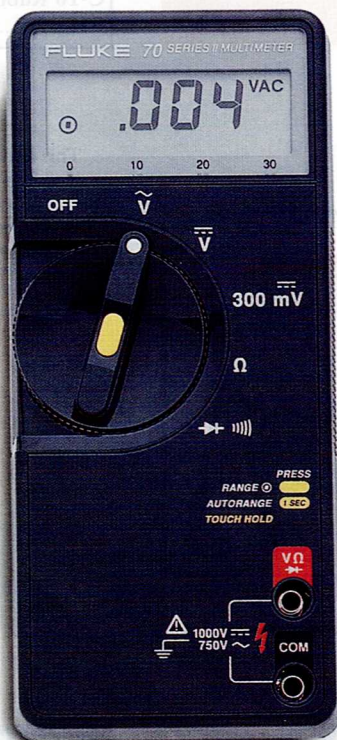
Remarkable features combine to provide more information than a hand-held multimeter ever has before. Model 73's digital display delivers highly accurate readings and clear resolution. An analog bar graph allows you to observe changing signals.

The 12-ounce unit is 1.12" x 2.95" x 6.55". Includes safety-

designed TL75 right-angle test lead pair, 2000-hour 9-V battery and user's manual. Three-year warranty with one-year calibration guarantee.

Model 73 Multimeter

045X004	1-5, \$109.00 ea.; 6-up, \$103.50 ea.
C-70Y Rubber Holster (Yellow)	
045X910	\$18.00 ea.
C-50 Compact Soft Case	
045X899	\$18.00 ea.



Models 70/73 Specifications

Measurement	Ranges	Measurement Range
Voltage (ac)	4	0.1 mV-750 V
Voltage (dc)	5	0.1 mV-1 kV
Ohms	6	0.1 Ω -32 M Ω
Diode/Continuity	1	0.1 mV-2 V
Current* (ac/dc)	3	0.01 mA-10 A

* Current range is not available on Model 70



Fluke 76 Series II

True-RMS Measurement at a Value Price

- 4000-count digital display (9999 for frequency and capacitance)
- $\pm 0.3\% + 1$ best dc voltage accuracy
- $\pm 1.5\% + 2$ best ac voltage accuracy
- $\pm 0.4\% + 1$ best ohms accuracy

Model 76 is a full-featured true-rms meter with Fluke reliability and performance plus additional measurement capabilities. This rugged, dependable and safety-rated DMM is as easy to use as it is on your budget. The 76 is designed for maximum convenience. Choose a function and let autoranging select the range with the greatest accuracy and resolution. Or select the range yourself. Touch Hold® automatically captures and holds a reading in memory while you concentrate on contacting the right test point. This helps reduce the risk of electrical shock or component damage and gives you time to log the measurement.

An average responding meter can give non-linear load readings that are 40% or more in error. The true-rms Fluke 76 delivers accuracy, dependability and safety to measure distorted waveforms at a truly affordable price. This tough meter is the only one in its class that conforms to the latest international safety standards. Besides measuring true-rms ac volts and current, dc volts and current, ohms, capacitance and continuity, a built-in frequency counter measures voltage input frequency of 1 Hz to over 20 kHz. A fast responding analog bar graph lets you view unstable signals. Select Smoothing™ for a stable digital reading.

The 12-ounce unit is 1.12" x 2.95" x 6.55". Includes Hard Point™ TL75 right-angle test leads, yellow C70Y Holster with Flex-Stand, 9-volt alkaline battery, quick reference card and user's manual. Three-year warranty with one-year calibration guarantee.

045X007 Model 76 Multimeter 1-5, \$199.00 ea.; 6-up, \$189.00 ea.

045X899 C-50 Compact Soft Case 18.00 ea.

Model 76 Specifications		
Measurement	Ranges	Measurement Range
Voltage (ac)	5	400 mV-600 V
Voltage (dc)	4	4 V-600 V
Ohms	6	400 Ω -40 M Ω
Diode Test	1	2.45 V
Capacitance	5	99.99 nF-999.9 μ F
Frequency	4	99.99 Hz-20 kHz



Fluke 77 Series II/23 Series II

The World's Most Popular DMM Has Been Improved

- 3200-count digital display
- 0.3% basic dc V accuracy
- Diode test
- Audible continuity

Fluke has improved its classic Models 77/23, the most popular DMMs ever. Automatic Touch Hold® locks captured measurement on LCD and allows for automatic updating with each new measurement (with no resetting). They feature exceptional overload protection against overloads on all ranges (1000 V dc, 750 V ac and 500 V resistance). All current ranges are protected with high-energy fuses (including 10-A range). Simple one-handed operation conveniently lets user access a comprehensive set of functions quickly, intuitively...even while wearing gloves.

The Fluke 77/23 offer high resolution, fast autoranging, manual ranging, range hold, continuity beeper, diode test, automatic self-test and 2000-hour battery life. Sleep Mode conserves battery life by shutting off meter when you forget to!

Choose traditional amber color (specify Fluke 77) or high-visibility yellow (specify Fluke 23). Includes Fluke's unique yellow holster with Flex-Stand™, TL75 safety-designed test leads, batteries and illustrated user's guide. Three-year warranty.

045X008 Model 77 DMM 1-5, \$179.00 ea.; 6-up, \$170.00 ea.

045X155 Model 23 DMM 1-5, 179.00 ea.; 6-up, 170.00 ea.

045X899 C-50 Compact Soft Case 18.00 ea.

Models 77/23 Specifications		
Measurement	Ranges	Measurement Range
Voltage (dc)	5	0.01 mV-1 kV
Voltage (ac)	4	0.1 mV-750 V
Ohms	6	0.1 Ω -32 M Ω
Current (dc/ac)	3	0.01 mA-10A
Diode/Continuity	1	0.1 mV-2 V



Fluke 79 Series II/29 Series II

Now with Capacitance, Frequency and Low-Ohms

- Frequency from 1 Hz to over 20 kHz
- Lo-ohms with 0.01- Ω resolution
- Plus all the features of the 77/23

Models 79/29 are the newest and most powerful member of Fluke's 70 Series DMMs. They put advanced measurement capability plus state-of-the-art analog and digital high-performance features within your grasp at a very affordable price. You don't need to carry an extra capacitance tester because Fluke 79/29 check capacitance from 10 pF to 9999 μ F. A built-in frequency counter lets you measure from 1 Hz to over 20 kHz with the unique ability to provide a digital display of frequency while simultaneously showing ac voltage levels on the analog bar graph.

Fluke 79/29 include a very fast 63-segment analog bar graph that updates at a rate of 40 times per second, or as fast as the eye can see, truly simulating an analog needle. Speed and high resolution give you the perfect tool for detecting peaking, nulling and trending. Lo-Ohms range offers a 40- Ω range with Fluke's proprietary zero calibration technique, compensating for test lead resistance and featuring 0.01- Ω resolution with high noise rejection. Smoothing considers jitter and digit rattle due to rapidly changing signals a thing of the past. Includes all the standard features of Fluke's world famous Models 77/23 including automatic Touch Hold, high resolution, fast autoranging and range hold, audible continuity beeper, diode test and battery-saving sleep mode.

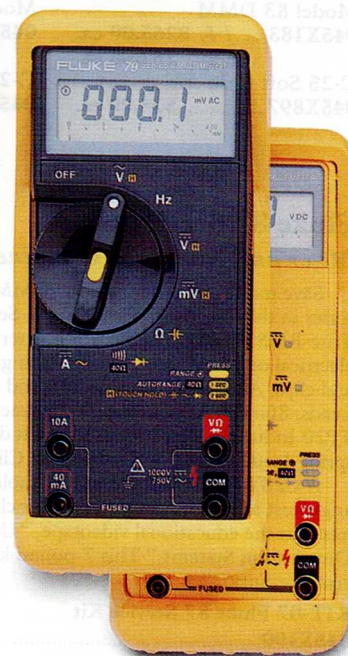
Choose traditional amber color (Fluke 79) or high-visibility yellow (Fluke 29). Includes yellow holster with Flex-Stand™, TL75 safety test leads, batteries and illustrated user's guide. Three-year warranty.

044X160 Model 79 DMM 1-5, \$199.00 ea.; 6-up, \$189.00 ea.

044X125 Model 29 DMM 1-5, 199.00 ea.; 6-up, 189.00 ea.

045X899 C-50 Compact Soft Case 18.00 ea.

Models 79/29 Specifications		
Measurement	Ranges	Measurement Range
Voltage (dc)	6	0.01 mV-1 kV
Voltage (ac)	5	0.1 mV-750 V
Ohms	6	0.1 Ω -50 M Ω
Current (dc/ac)	4	0.001 mA-10 A
Diode/Continuity	1	0.1 mV-2 V
Capacitance	6	0.01 nF-9999 μ F
Low-Ohms	3	0.01 Ω -8 k Ω
Frequency	6	0.01 Hz-20 kHz



Fluke 80-Series

The First Multimeters That Are Truly "Multi"

- Min/max average recording mode
- Make frequency, duty cycle and capacitance measurements
- 3.5-digit, 4000-count digital display
- 4.5-digit, true-rms mode (Model 87 only)
- Touch Hold® and relative modes
- Input Alert™ and overload protection
- Rugged construction with splash-proof, dust-proof design

These third-generation, state-of-the-art multimeters can do for you what no other hand-held meter can — at any price. The versatile Fluke 80-Series Models 83, 85 and 87 share many features. Each one performs as a high-end digital multimeter, an analog meter, a frequency counter, a recorder and a capacitance tester — plus a whole lot more. Compare these multiple capabilities to those of the meter you are presently using. Then take a look at the outstanding array of features Fluke has designed into these instruments.

Min/Max Average Recording Mode simultaneously stores the highest, lowest and average of all readings — allowing you to monitor a signal for seconds or up to days (average up to 36 hours). The Min Max Alert even gives an audible tone for readings above or below previous minimums or maximums. Make frequency measurements from 0.5 Hz to greater than 200 kHz, duty cycle measurements from 0.1% to 99.9% of cycle plus capacitance measurements from 10 pF to 5 µF. Even larger capacitors may be measured by using the analog display in the resistance mode.

The 3.5-digit, 4000-count digital display updates four times per second. To see unstable signals, the analog display updates 40 times per second. Models 83 and 85 use analog bar graphs and a Zoom Mode for higher resolution (analog). The 87 features a high-resolution analog pointer.

Touch Hold® is among other Fluke 80-Series standard features. It captures the measurement, beeps and locks it on the LCD for future viewing. In addition, it also automatically updates with every new measurement. Relative Mode displays the change between any stored measurement with any subsequent measurements. Input Alert™ provides an audible warning if the input jack connections are not correct for the measurement selected. Each model is overload protected to 1000 volts in both ohms and diode test.

Fluke 80-Series meters feature rugged construction. They are designed to be splash proof and dust proof. A protective holster is even provided to protect the meter in harsh operating conditions. These meters are sealed and EMI shielded. Each 80-Series multimeter is supplied with Fluke's exclusive yellow protective holster (with Flex Stand™), safety-designed test leads, 9-volt battery, manual and operations guide. Choose from three models. Three-year warranty.



Model 83

- 3.5-digit display
- 0.3% basic dc accuracy
- 1.0% basic ac accuracy
- 5 kHz ac V
- Analog bar graph and zoom
- Three-year warranty

Model 83 DMM

045X1831-5, \$265.00 ea.
6-up, 251.00 ea.

C-25 Soft Case

045X897\$24.00 ea.

Model 85

- All the Model 83 features
- 0.1% basic dc accuracy
- 0.5% basic ac accuracy
- 20 kHz ac V
- Analog bar graph and zoom
- Three-year warranty

Model 85 DMM

045X1851-5, \$305.00 ea.
6-up, 290.00 ea.

C-25 Soft Case

045X897\$24.00 ea.

Model 87

- All the Model 85 features
- 0.1% basic dc accuracy
- 0.7% basic ac accuracy
- True rms (ac)
- 4.5-digit mode
- Backlit display

Model 87 DMM

045X1871-5, \$335.00 ea.
6-up, 318.00 ea.

C-25 Soft Case

045X897\$24.00 ea.

83/85/87 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	0.1 mV - 1 kV
Voltage (ac)	5	0.1 mV - 1 kV
Ohms	7	0.1 Ω - 40 MΩ
Current (dc/ac)	6	0.1 µA - 10A*
Capacitance	6	0.01 nF - 5 µF
Frequency	5	0.01 Hz - 200 kHz

*10A continuous, 20A for 30 seconds minimum.

Fluke 87 Service Kit

Meter and Accessories Combined for Affordability

Save money by ordering your DMM along with its most popular accessories in the fully equipped Fluke 87 Service Kit. It contains a Fluke 87 True-RMS Analog/Digital Multimeter plus the tools you need for industrial, electrical or HVAC applications. You get durable, safety-tested leads, probes and clips. Accessories include hot- and cold-resistant TL22 Flexible Test Leads, 80i-400 AC Current Probe (measures current to 400 A), extra-long TP20 Industrial Test Probes to reach deep test points and safety-grip, spring-loaded AC20 Industrial Test Clips with extra wide jaw openings.

A C28Y Hard Shell DuraCase™ holds the meter in transit with right-angle test leads connected. The kit includes training and application booklets plus the educational videotape, "Understanding Harmonics in Power Distribution Systems." This 7-pound kit measures 9" x 5" x 11". One-year warranty.

KIT-87 Fluke 87 Service Kit

045X1901-5, \$469.00 ea.; 6-up, \$446.00 ea.

FLUKE

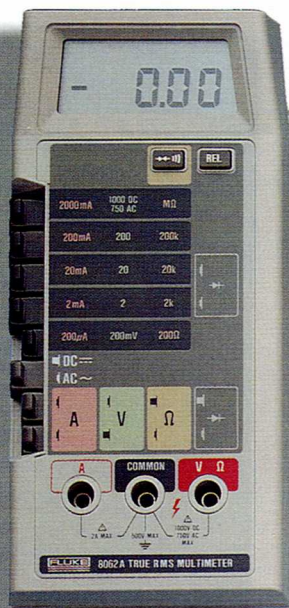


8060 Series

Professional 4½-Digit Multimeters

- 4½-digit, 20,000-count resolution
- High basic dc accuracy (0.5%, 8062A; 0.04%, 8060A)
- 0.2% basic ac accuracy
- True-rms ac voltages
- Conductance measurements

Fluke's 8060 Series of handheld DMMs offers far more measurement capabilities than most bench units. With microcomputer-based technology, they offer unique features. The microcomputer performs such automatic tasks as subtracting lead resistance when measuring ohms, converting voltage of dB or dBm, averaging updated measurements to reduce noise, taking the reciprocal of period measurements to indicate frequency and displaying the difference between stored reference and measured value. The 8062A and 8060A are ideal for engineers, technicians and hobbyists skilled in audio, video,



8060A/8062A Specifications

Measurement	Ranges	Measurement Range
Volts (dc)	7	0.01 mV-1 kV
Volts (ac)	6	0.01 mV-750 V
Ohms	8	0.01 Ω-300 MΩ
Current (dc/ac)	5	0.01 μA-2000 mA
Diode	1	0.1 mV-2 V
dB Measurement (ac)	5*	-50 dBm-59.72 dBm
dB Measurement (dc)	5*	-74 dBm-62.22 dBm
Frequency*	4	0.01 Hz-200 kHz

* Model 8060A only

test and relative offset capabilities. The 8060A includes all these features plus dB measurement for telecom applications, better accuracy, true rms (ac voltage) to 100 Hz and frequency to 200 kHz. This top-of-the-line handheld DMM is the choice of professional engineers the world over!

All Fluke optional accessories will work with the 8060 Series. Each meter is 1.8" x 3.4" x 7.1" and weighs .90 pounds. Comes with test leads, 9-volt battery, spare fuse, manual and one-year warranty.

045X825	8062A 4½-Digit DMM.....1-5,	\$389.00 ea.; 6-up, \$366.00 ea.
045X820	8060A 4½-Digit DMM.....1-5,	459.00 ea.; 6-up, 431.00 ea.
376X600	TLS-2000B Deluxe Test Lead Set.....	35.00 ea.
045X915	C-90 Carrying Case.....	18.00 ea.

telecommunications or computer technology. They have the same rugged case, safety-engineered inputs, test leads, double-fused current inputs and extensive overload protection as other Fluke handheld DMMs.

The 8062A is a basic meter with such useful features as constant-current diode test, low-power ohms



Model 45 DMM

Dual-Display, Five-Digit Digital Multimeter

This is a flexible five-digit, 100,000-count, dual-display multimeter with capabilities usually found on more expensive devices. The feature-rich Model 45 has an easy-to-use, turn-key measurement system. It provides true-rms voltage and current (ac + dc) as well as 16 different measurement capabilities. A unique multi-function vacuum fluorescent dual display permits measurement of two signal parameters from a single test connection. This lets you perform two separate measurements from the same signal. High quality, performance and versatility accommodate manufacturing test, depot and field service as well as R&D applications. The standard RS-232 connection makes it ideal for PC instrument applications.

Model 45 measures frequency to 1 MHz, dB with selectable reference of 2-8000 Ω and dc current accuracy (outstanding 0.05%) for 4-20 mA current loop service. It provides high resolution of 1 V and .01 V, Touch Hold® to capture stable measurements and Min/Max to record readings.

The 5.2-pound unit 3.67" x 8.5" x 11.27". Includes ac line cord, test leads, operator's manual and quick reference guide. Available with rechargeable battery pack and/or optional IEEE-488 interface. One-year warranty.

Basic Model 45 DMM

044X0501-5, \$679.00 ea.; 6-up, \$652.00 ea.

Model 45-01 (w/ Battery Option)

044X0521-5, \$809.00 ea.; 6-up, \$777.00 ea.

45-05 DMM (w/ IEEE-488)

044X0541-5, \$839.00 ea.; 6-up, \$805.00 ea.

45-15 (w/ IEEE-488 and Battery)

044X0561-5, \$969.00 ea.; 6-up, \$930.00 ea.

Model 45 Specifications

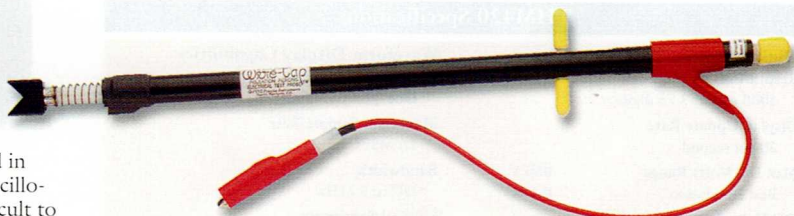
Measurement	Ranges	Measurement Range
Volts (dc)	5	0.1 μV-1 kV
Volts (ac)	5	0.1 μV-750 V
Ohms	7	1 mΩ-300 MΩ
AC/DC Current	4	100 nA-10 A
Frequency	5	5 Hz-1 MHz

Wire-tap™

Insulation Piercing Electrical Test Probe

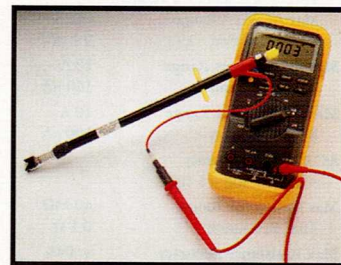
This is the best checkout aid since the invention of the volt-meter. The Wire-tap™ probe is a precision instrument designed to tap electrical wires for voltage and resistance measurements. It is used in conjunction with a volt/ohmmeter or other instrument such as an oscilloscope. The long probe body allows you to get at areas ordinarily difficult to reach. Applications include auto dash wiring, engine compartments, appliance wiring and industrial controls. The Wire-tap probe will greatly speed up troubleshooting and checkout on any wiring system, especially automotive, and quickly justify its cost. Using this probe is actually fun, and it should become one of the primary tools in your troubleshooting arsenal.

The patented Wire-tap was developed after hundreds of hours of experimenting and prototyping with many materials and techniques. Its unique wire hook employs a Teflon coating that easily slips between and behind wires in a bundle. You can let go of the probe, and it will hold itself onto the wire under test. With this probe, you can test tiny 30-gauge wire wrap up to power cables ½ inch thick! No other probe can provide this range or accuracy. The wide-range capability is partly due to the probe's unique needle control. Unlike old spring-operated probes with fixed needle pressure, you control the needle pressure and position for different wire types and sizes by using threading action. Just a feather touch is needed to penetrate most wires. On small wires you'll need to use a magnifying glass to see the resulting insulation hole. If needed, the probe's hardened needle can be removed and resharpened easily.



Precise Instruments

Connect the probe to your instrument via a high-flex silicon covered pigtail lead. This lead has a female connector which accepts the world standard size voltmeter test tip (.080 inch/2 mm diameter) or the special included alligator clip for universal use. There's nothing else to buy. Wire-tap comes packaged in a clear plastic storage case complete with instructions. Choose from 7" and 11" test probe sizes. Made in the U.S.A. Thirty-day warranty.



633X200	Wire-tap Regular 7" .....1-5,	\$34.50 ea.; 6-up, \$32.00 ea.
633X240	Wire-tap XL 11" .....1-5,	36.50 ea.; 6-up, 34.00 ea.



Model THM420 TekWaveMeter

The Next-Generation DMM

- Autoranging true-rms DMM
- Smart, affordable, handheld meter
- A new benchmark in ease of use
- 5-MHz graphical waveform display
- 16 MS/s sampling rate, six-bit A/D

The THM420 TekWaveMeter DMM with Graphical Waveform Display is a breakthrough value. You get two instruments, a DMM and an oscilloscope, in a single handheld unit for the price of one. This multipurpose, multifunctional TekTool™ from Tektronix is designed for a wide variety of applications. Field service and engineering technicians can use it for troubleshooting, maintenance, installation, calibration and repair of industrial, electronic, production and medical equipment.

This meter is designed to be rugged and easy to use with the familiar look and feel of a DMM. It provides both digital and analog bar graph display. Two modes, DMM and waveform, are selectable by a toggle key. The rotary knob selects the function. Use meter mode to take a reading of the measurement. Use waveform mode to see signal characteristics such as noise, waveform distortion, glitches and intermittent failures. Meter mode functions include ac/dc voltage, ac/dc current, resistance, diode test, frequency and continuity check beeper.

Graphical waveform display features include 16-MS/s digitizer and 5-MHz waveform bandwidth, enough to cover almost all electrical and electronic field service applications. The bar graph gives a true simulation of an analog meter and is great for detecting peaks, nulls and trends. It provides fast visual indication for viewing measurements. True-rms measurement is provided for making accurate measurements in the presence of harmonics. In waveform mode, autoranging scope functions include scale, position, trigger and in-line current waveform. It displays a graphic picture of the measurement to show characteristics like noise, waveform distortion, glitches and intermittent failures. In-line current measurement and the ability to display a signal graphically (not just numerically) make the THM420 ideal for low-current sensor applications.

THM420 Specifications

Digital Multimeter Capabilities		Waveform Display Capabilities	
Resolution	4000 count, 3.75 digits	Digitizers, Channels	One
Display Update Rate	20 per second	Maximum Sample Rate	16 MS/s
Max DC Volts Range	850 V	Bandwidth	DC to 5 MHz
Best Resolution	0.1 mV	Vertical Sensitivity	5 mV to 200 V/div
DC Volts Accuracy	±(0.3% of reading + 2 counts)		50 µA to 100 mA/div
Max AC Volts Range	600 V		50 mA to 2 A/div
Best Resolution	0.1 mV	DC Accuracy	±(3.5% of reading + 2 counts)
Max DC Current Range	10 A	Resolution	6 bits
Best Resolution	100 µA	Trigger Mode	Auto
Max AC Current Range	10 A	Trigger Position	Pre, Post, Center
Best Resolution	100 µA	Trigger Coupling	DC
AC Current Accuracy	±(1.8% of rdg + 5 cts)	Trigger Slope	Pos. Neg.
Max Resistance Range	40 MΩ	Max Input	850 V dc or 600 V ac
Min. Resolution	0.1 Ω		
Max Resistance Accuracy	±.04%		
Continuity Check			
Frequency Range	100 Hz to 1 MHz		
Frequency Resolution	0.01 Hz to 100 Hz		
Best Frequency Accuracy	±0.1%		



A large, easy-to-read LCD screen with 3.75-digit display is viewable both inside and outside. Viewing exposure is increased by the use of a backlight. While the TekWaveMeter is autoranging, users may make measurements in a particular range with range hold. This causes the meter to exit autorange mode and keeps it in the selected range. Data hold instantly captures and locks a measurement on the display. The auto power off feature automatically shuts down the meter if it is left untouched for 30 minutes to preserve your batteries. The low battery indicator function displays a battery icon on the display when the batteries are getting low. This informs the user that it is time to change the batteries.

The durable THM420 withstands the rigors of field use and the manufacturing environment. This small DMM form factor provides one-handed operation and is easy to carry. Includes test leads, fuses, battery compartment, six 12-hour AA batteries and manual. The 90 mm x 65 mm x 208 mm unit weighs 640-grams with batteries. One-year warranty.

220X960 THM420 TekWaveMeter.....1-5, \$595.00 ea.; 6-up, \$572.00 ea.





860 Series

Graphical™ Multimeters

- 4½-digit, high accuracy true-rms or averaging responding multimeter
- DC to 1 MHz digital waveform display
- TrendGraph™ Mode — an electronic stripchart recorder
- 10-MHz frequency counter
- Internal ni-cad or alkaline battery operation
- Compliance with IEC 1010-1 Class III at 1000 volts
- Classic, easy-to-use DMM rotary switch user interface
- In-circuit component test (865, 867)
- Logic activity mode (865, 867)
- LCD backlight (865, 867)
- Internal battery charging (865, 867)
- Waveform memory (865, 867)
- RS-232 cable and adaptors plus companion software (867)

Fluke introduces a new category of high-performance troubleshooting tools. The 860 Series Graphical Multimeters combine the industry's most advanced multimeter capabilities with the visual power of waveform display, in-circuit component testing, trend plotting and logic activity detection together in one easy-to-use, hand-held instrument. This family of three GMM test tools is the first group of high-accuracy, high-performance multimeters combined with analog, digital and graphical displays. Use these multi-purpose, multi-functional tools for a wide variety of applications including troubleshooting, maintenance, installation and calibration of industrial, medical and production equipment; repair of computers and office machines; plus repair and maintenance of telecommunications and home entertainment systems. Access graphical power through easy-to-use classic rotary switch. Simplified user interface virtually eliminates long learning curves.

Select the display mode to view information in the form best suited for your application for fast, more effective troubleshooting. And for the first time, this graphical power is accessed through an easy-to-use, rotary switch familiar to many multimeter users. This simplified user interface virtually eliminates long learning curves.

These meters offer the highest accuracy (0.025%) in a hand-held meter. The 860 Series features 32,000-count (4.5-digit) resolution, dual digital display with additional information about parameter being measured and Analog Needle-Graph™ display. Meter mode allows direct measurements of ac and dc volts and current, resistance, conductance, capacitance, frequency, duty cycle, pulse width, period and dB. Waveform display with up to 1-MHz signal bandwidth provides a clear picture of noise, waveform distortion, intermittent failures and glitches. Full auto waveform display setup automatically scales voltage, time-base, triggering and position for fast, easy test setups. True-rms or averaging responding meters offer AutoDiode™ Feature (patent pending), manual setup and external triggering. TrendGraph™ mode plots high-resolution



meter readings for up to 30 hours in intervals of 1 second to 15 minutes to detect power sags/surges and droops. It saves users time by automatically collecting and graphing information.

An In-Circuit Component Test lets technicians view component signatures in circuit without removing and handling sensitive and expensive components. This test feature lets users troubleshoot problems by comparing component signatures of known, functioning circuits with defective circuits. Users can safely check components without having to power up the entire circuit. The Logic Activity Mode offers a simple way to isolate digital failures. It indicates logic transitions or state changes to 10 MHz and shows if the circuit is active or stuck high or low. Also it shows frequency of activity and average of dc voltage.

With RS-232 interface, technicians can upload known waveforms or component signatures from a computer for on-screen comparison or download information from the GMM to a serial printer or computer. Information can be transferred to reports for documentation or analysis as well as logged directly into a data file.

True IEC-1010-1 Class III 1000-V protection is provided in all functions. Powered by six internal AA alkaline batteries. Choose from three models. Fluke 863 includes TL70A Test Leads. Model 865 comes with TL70A Test Leads and external line-powered battery eliminator. The 867 includes TL20 Industrial Test Lead Set, external line-powered battery eliminator, internal rechargeable ni-cad battery pack, optically isolated RS-232 cable and adaptors plus FlukeView 860 Software. Each meter without batteries weighs 2.33 pounds. With battery pack, it is 3.01 pounds. With AA batteries, it is 2.64 pounds. Each GMM is 9.7" x 5.4" x 2.75". Three-year warranty.

860 Series GMM Feature Comparison

	867	865	863
Basic dc Accuracy	.025%	.04%	.04%
30-mA dc Current Accuracy	.05% ± 15	.05% ± 15	.1% ± 15
Current Ranges	6	6	4
Frequency Counter Range	>10 MHz	>10 MHz	2 MHz
Meter ac Bandwidth (-1 dB)	300 kHz	300 kHz	300 kHz
Waveform Display Bandwidth	1 MHz	1 MHz	1 MHz
Logic Activity Mode	✓	✓	
In-Circuit Component Test	✓	✓	
LCD Backlight	✓	✓	
Internal Battery Charging	✓	✓	
Waveform Memory	✓	✓	
TL70A Test Leads		✓	✓
TL20A Test Leads	✓		
Alkaline Batteries		✓	✓
Ni-cad Batteries	✓		
Battery Eliminator	✓	✓	
RS-232 Cable and Adaptors	✓		
FlukeView 860 Software	✓		

- 044X303 Model 863E.....1-2, \$ 690.00 ea.; 3-up, \$ 668.00 ea.
 044X305 Model 865E.....1-2, 890.00 ea.; 3-up, 860.00 ea.
 044X307 Model 867E.....1-2, 1090.00 ea.; 3-up, 1052.00 ea.



Model DM-2

The Most Affordable and Compact DMM

- Compact meter with current measuring ability
- Performs five standard DMM functions
- Basic V dc accuracy of 0.8%

Model DM-2 is Wavetek's most compact multimeter with current measuring capability. It has a 1999-count, 3½-digit display with numerals .5" high. This economy model provides four standard DMM functions. Use it



DM-2 Specifications

dc Volts	200 mV, 2, 20, 200 1000 V
Accuracy	0.8%
Resolution	100 µV
ac Volts	200 V, 500 V
dc Current	200 µA, 2, 20, 200 mA
Fusing	0.5 A, 250 V
Resistance	200 Ω, 2, 20, 200 kΩ, 2 MΩ

204X702 DM-2 Pocket-Sized Meter.....1-5, \$29.95 ea.; 6-up, \$28.25 ea.
204X015 VC-20 Carrying Case.....12.00 ea.

to measure ac and dc volts, dc current, resistance and diode junctions. A single 9-volt, 170-hour battery powers the DM-2 which also has a low battery indicator. Includes test leads, 9-volt battery, spare fuse and operator's manual. The pocket-sized meter measures 4.7" x 2.8" x 1", weighs 7 ounces and comes with a one-year warranty.

Model DM-10XL

Upgraded dc Accuracy and ac Volts Range

- Safety Tester™ and fused current jack
- Tests continuity and diodes
- Upgraded V dc accuracy of 0.7%

The DM-10XL is a diode tester and continuity beeper with more accurate dc voltage as well as higher ac voltage, dc current and resistance measurements. It has a 1999-count, 3½-digit display with numerals .7" high. The large display makes reading numerals easier from a distance. Wavetek's Safety Tester™ detects live voltage presence (ac or dc) of 6-220 V. A self-powered indicator provides a quick, foolproof check for existing voltage even if the battery is dead. The fused 10-A current jack provides protection from meter damage and personal injury in an affordable meter. A warning beeper sounds if test leads are plugged into the wrong input jack.



DM-10XL Specifications

dc Volts	200 mV-1000 V
Accuracy	0.7%
Resolution	100 µV
Input Impedance	10 MΩ
ac Volts	200 V, 750 V
dc Current	200 µA-10 A
Resistance	200 Ω-20 MΩ

204X710 DM-10XL Pocket-Sized Meter...1-5, \$49.95 ea.; 6-up, \$47.50 ea.
204X015 VC-20 Carrying Case.....12.00 ea.

Safety test leads feature shrouded plugs and insulated probe tips. A single 9-volt, 300-hour battery powers the DM-10XL which has a low battery indicator. Includes test leads, 9-volt battery, spare fuse and operator's manual. The pocket-sized meter measures 6.1" x 2.8" x 1.3", weighs 8 ounces and comes with a one-year warranty.

Model DM5-XL

Full-Function DMM with Large LCD

- Extra large, easy-to-read LCD
- Same functions as DM-2 plus continuity beeper
- Safety test leads and input warning beeper

Wavetek's model DM-5XL is a diode tester and continuity beeper. It has a 1999-count, 3½-digit display with numerals .7" high. The unit's safety features include a warning beeper that sounds if test leads are plugged into the wrong input jack, as well as safety test leads with shrouded plugs and insulated probe tips.



DM-5XL Specifications

dc Volts	200 mV-1000 V
Accuracy	0.8%
Resolution	100 µV
Input Impedance	1 MΩ
ac Volts	200 V, 500 V
dc Current	200 µA-200 mA
Resistance	200 Ω-2 MΩ

204X705 DM-5XL Pocket-Sized Meter...1-5, \$39.95 ea.; 6-up, \$37.95 ea.
204X015 VC-20 Carrying Case.....12.00 ea.

A single 9-volt, 300-hour battery powers the DM-5XL which also has a low battery indicator. Includes test leads, 9-volt battery, spare fuse and operator's manual. The pocket-sized meter measures 6.1" x 2.8" x 1.3", weighs 8 ounces and comes with a one-year warranty.

Model DM-15XL

Includes Logic Probe in One Economical Instrument

- Logic probe troubleshoots digital circuits
- Fused 10 A ac/dc current jack
- Most accurate dc voltage measurements

Wavetek's DM-15XL is a diode tester and continuity beeper with more accurate dc voltage measurements as well as higher dc and ac current and resistance measurements. It has a 1999-count, 3½-digit display with numerals .7" high. The large display makes reading numerals easier from a distance. This top-of-the-line model also has a 20-MHz TTL logic probe to troubleshoot digital circuits. A fused 10-A ac/dc current jack provides protection from meter damage and personal injury in an affordable meter. Additional safety features include a warning beeper that sounds if test leads are plugged into the wrong input jack. Test leads with shrouded banana plugs and insulated probe tips protect the user from harm.



DM-15XL Specifications

dc Volts	200 mV-1000 V
Accuracy	0.5%
Resolution	100 µV
Input Impedance	10 MΩ
ac Volts	200 mV, 750 V
dc Current	200 µA-10 A
ac Current	200 µA-10 A
Resistance	200 Ω-2000 MΩ

204X716 DM-15XL Pocket-Sized Meter...1-5, \$59.95 ea.; 6-up, \$56.95 ea.
204X015 VC-20 Carrying Case.....12.00 ea.

A single 9-volt, 300-hour battery powers the DM-15XL which has a low battery indicator. Includes test leads, 9-volt battery, spare fuse and operator's manual. The pocket-sized meter measures 6.1" x 2.8" x 1.3", weighs 8 ounces and comes with a one-year warranty.

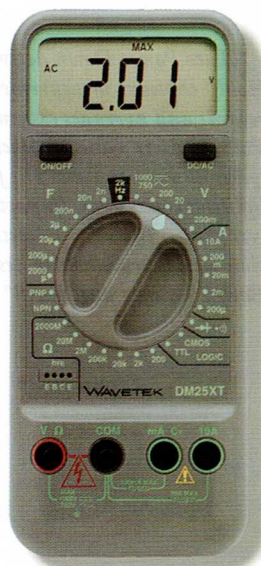


Model DM25XT

Multi-Function DMM

The DM25XT from Wavetek functions as a voltmeter, ohmmeter, 20-A ammeter, diode tester, continuity tester, capacitance meter, 20-MHz logic probe and transistor tester. This multi-function DMM features audible continuity and transistor gain measurement.

The DM25XT has a large, 3.5-digit LCD display with annunciators. Displayed information includes range, function and ancillary. Model DM25XT measures signal frequency to 2 kHz and capacitance to 2000 μ F. It has a 2-kM Ω resistance range. This meter performs go, no-go tests on light-emitting diodes. Zero adjustment, overload indication and low-battery indication are standard. Convenience features include auto-off to extend battery life and a handy tilt stand.



Model DM25XT Specifications

Measurement	Ranges	Measurement Range
Volts ac	5	200 mV-750 V
Volts dc	5	200 mV-1 kV
Current ac	5	200 μ -20 A
Current dc	5	200 μ to 20 A
Resistance (Ω)	7	200 Ω -2000 M Ω
Capacitance	7	2 nF-2 μ F

Included are test leads, 100-hour 9-volt alkaline battery, two fuses and manual. It measures 6.3" x 3" x 1.4" and weighs 11 ounces including battery. It is backed by a one-year warranty.

204X726 DM-25XT 3.5-Digit DMM1-5, \$99.95 ea.; 6-up, \$95.00 ea.
204X201 VC-201 Carrying Case12.00 ea.

Model DM27XT

Nine Instruments in One

Wavetek's DM27XT is packed with features. It acts as a voltmeter, ohmmeter, 20-A ammeter, diode tester, continuity tester, LED tester, frequency counter, capacitance meter and 20-MHz logic probe. It has a large 1999-count, 3.5-digit LCD display with annunciators.

This compact hand-held meter offers 14 functions and 44 ranges. It checks every component. In addition to all the features of the DM25XT (except for transistor tester), the 27XT has five inductance ranges to measure chokes and coils. It offers frequency measurement to 20 MHz. This is the only all-in-one digital multimeter to measure above 200 kHz, making it the ideal tester for computer and telecom repair.



Model DM27XT Specifications

Measurement	Ranges	Measurement Range
Volts ac	4	200 mV-750 V
Volts dc	5	200 mV-1 kV
Current ac and dc	5	200 μ -20 A
Capacitance	7	2 nF-2 μ F
Resistance (Ω)	7	200 Ω -2000 M Ω
Frequency	Auto	20 MHz

Included are a pair of test leads, 100-hour 9-V alkaline battery, two fuses and manual. The unit measures 6.3" x 3" x 1.4" and weighs 11 ounces including battery. One-year warranty.

204X730 DM-27XT 3.5-Digit DMM1-5, \$119.95 ea.; 6-up, \$114.00 ea.
204X201 VC-201 Carrying Case12.00 ea.

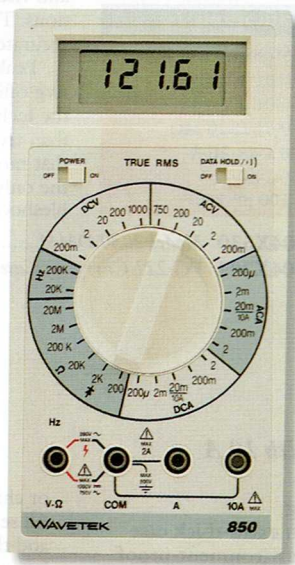
WAVETEK

Model 850

4.5-Digit, True-rms Hand-Held DMM

Featuring a rugged, reliable design, Wavetek's Model 850 offers true rms (ac coupled) readings. It has a full 4.5-digit LCD display and V dc accuracy of 0.05%. In addition to the standard multimeter functions of dc and ac volts, dc and ac amps and resistance, it measures frequency up to 200 kHz.

The 850 also checks diodes and continuity. Data hold keeps the last reading on the display. Model 850 shows the correct power content of any ac signal, whatever its waveform and distortion.



Included with the meter are a pair of test leads, 100-hour 9-V alkaline battery, two fuses and an owner's/operator's manual. The unit measures 6.8" x 3.5" x 1.4" and weighs 13 ounces including battery. One-year warranty.

Measurement	Ranges	Measurement Range
Volts ac	5	200 mV-750 V
Volts dc	5	200 mV-1000 V
Current ac	6	200 μ A-10 A
Current dc	6	200 μ A-10 A
Resistance (Ω)	6	200 Ω -20 M Ω
Frequency	2	20 kHz-200 kHz

204X850 850 4.5-Digit DMM1-5, \$229.00 ea.; 6-up, \$217.50 ea.
204X201 VC-201 Carrying Case12.00 ea.

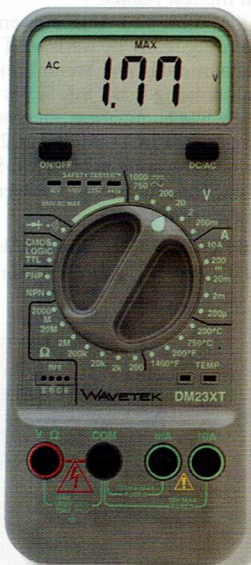
Model DM23XT

Compact DMM with 10-A Current Test

The DM23XT can measure the ambient temperature of a computer room, find the internal temperature of a chassis housing electronic circuitry and locate a hot component. Temperatures are displayed in Celsius or Fahrenheit. The Safety Tester™ tests ac voltages without using the battery. A bank of four LEDs indicates the presence of up to 440 V ac, making it perfect for dim equipment room measurements.

Model DM23XT also functions as a voltmeter, 10-A ammeter, 2000-M Ω ohmmeter, TTL and CMOS logic tester, audible continuity beeper, diode tester and input warning beeper. Features auto power off.

Measurement	Ranges	Measurement Ranges
Volts ac	5	200 mV-750 V
Volts dc	5	200 mV-1 kV
Current ac	5	200 μ -10 A
Current dc	5	200 μ -20 A
Resistance (Ω)	7	200 Ω -2000 M Ω
Temperature	4	-20 to 750 C/-4 to 1400 F
Transistor hFE		0-1000/NPN, PNP



The 11-ounce unit is 7.2" x 3.1" x 1.5". It comes with a 4-foot Type K thermocouple beaded wire, safety test leads, 9-V battery and manual. One-year warranty.

204X723 DM-23XT 3.5-Digit DMM1-5, \$89.95 ea.; 6-up, \$85.50 ea.
204X201 VC-201 Carrying Case12.00 ea.



Series 2000 Innovative Troubleshooting Meters

Wavetek's versatile, reliable DMMs have more test and measurement capabilities and troubleshooting features than any other hand-held DMM on the market today. Capacitance meters to 2000 μ F and frequency counters to 2 MHz with low ohms resolution of 0.01 Ω , they find intermittents, detect pulse and measure low resistance. These true-rms meters are ac and dc coupled to accommodate any measurement. Each has a four-digit, 19,999-count quadruplex LCD with annunciators and bar graph plus menu and safety features. Relative Mode zeroes out resistance for improved accuracy.

WAVETEK

Model 2020

- Basic accuracy of 0.25%
- True rms
- Analog bar graph LCD
- Peak Hold measures 1-ms spikes
- Backlit for reduced-light viewing

The 2020 goes beyond supplying the field service technician's basics needs. It also provides true-rms voltage and current measurements, Peak Hold for measuring ac voltage spikes as short as 1 ms and a fiberoptic backlight so the large LCD is legible in dark work areas. Model 2020 lets you take measurements with your eyes on the test points.

Audible and visual aids enhance speed while ensuring safety by warning if incorrect inputs are encountered. The Menu Function Selection and autoranging make this Series 2000 DMM faster to use while eliminating guesswork with an informative backlit LCD. Model 2020 is an exceptional value for testing pcbs, CMOS/TTL circuits, capacitors, motors and power supplies plus checking current surges.

204X520 Model 2020 DMM1-5, \$289.00 ea.; 6-up, \$275.00 ea.
204X204 VC-221 Carrying Case16.00 ea.



Model 2030

- Basic accuracy of 0.10%
- True rms
- Analog bar graph LCD
- Peak Hold measures 1-ms spikes
- Backlit for reduced-light viewing

Model 2030 is the field service answer for a versatile, accurate, reliable, low-cost test instrument. Simple, menu-driven feature selection of test functions plus informative displays and audible tones take the guesswork out of interpreting displayed readings. In addition to the standard Series 2000 features, the 2030 has many audible

and visual indications. They provide unmatched safety while taking accurate measurements.

Peak Hold, Probe Hold™ and Auto Min Max Avg offer exceptional test capabilities. They enable the technician to concentrate on test probes rather than trying to see intermittents or voltage spikes that most DMMs display fleetingly. The 2030 is the only test instrument needed for most troubleshooting situations.

204X530 Model 2030 DMM.....1-5, \$299.00 ea.; 6-up, \$285.00 ea.
204X204 VC-221 Carrying Case16.00 ea.



Series 2000 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	0.01 mV-1 kV
Voltage (ac)	5	0.01 mV-1 kV
Resistance (Ω)	7	0.01 Ω -20 M Ω
Current (dc/ac)	6	0.1 μ A-20 A
Diode/Continuity		0.2 mV-2 V
Capacitance	6	100 pF-2 mF

Model HD-110

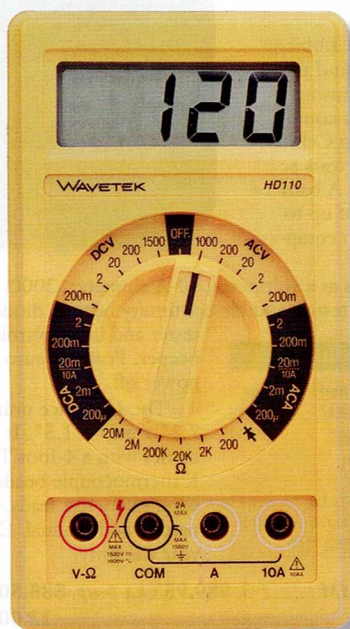
Heavy-Duty DMM with 10 A

- Basic accuracy of 0.25%
- 3.5-digit average sensing
- Robust and reliable with extra-thick case
- Completely sealed and environment-proof
- Enhanced by extra overload protection

Wavetek's Model HD-110 is designed for dependability under rugged industrial conditions. It is used with confidence by transportation companies, electrical contractors and maritime operators. The tough, fire-retardant thermoplastic case is extra thick so it won't crack

HD-110 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	5	200 mV-1500 V
Voltage (ac)	5	200 mV-1000 V
Resistance (Ω)	6	200 Ω -20 M Ω
Current (dc/ac)	6	200 μ A-10 A
Diode/Continuity		0-2 V



WAVETEK

or chip even if dropped from a height of 10 feet. All sensitive components are shock mounted, and the display window is ultrasonically welded into place. O-ring seals keep dirt, grime and liquids from contaminating the meter and causing inaccurate readings or damaging shorts.

This 3.5-digit average-sensing DMM features diode testing, RF shielding and Insta-Ohms for easy continuity tests. Model HD-110 can measure 10 amps ac or dc without special adapters. Its 10-amp current range is protected to 20 amps for 30 seconds (unfused). The HD-110 offers 0.25% dc volts accuracy.

Battery life is 2000 hours. Includes test lead set, 9-volt alkaline battery, spare fuse and manual. This 1.2-pound unit measures 6.9" x 3.7" x 1.8". One-year warranty.

HD-110 DMM

204X110.....1-5, \$219.00 ea.; 6-up, \$208.00 ea.

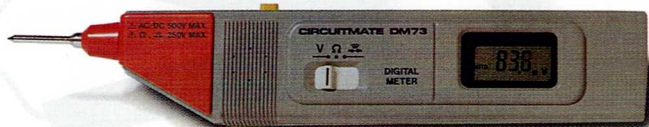


Model DM78A

Pocket-Sized Digital Multimeter

- Autoranging
- Full .38" high LCD readout
- 0.7% basic dc accuracy
- Carrying case included

Wavetek's Model DM78A has proven to be an ideal economy DMM because it's no larger than today's shirt-pocket calculator. This allows the user to have it with him at all times, eliminating lost time when the job requires only basic measurements. The DM78A packs the most used ranges into its extremely compact size. It utilizes an easy-to-read .38" high LCD display and is fully autoranging on all ranges, so making the correct measurement the first time very easy. It also has built-in diode check capabilities and an audible continuity beeper for making quick go/no/go decisions. The DM78A makes no pretension of being a full-functioned DMM, but as a secondary meter or for the convenience of being able to carry it at all times — it can't be beat!



WAVETEK

Specifications: dc voltage (200 mV, 2 V, 20 V, 200 V, 450 V), ac voltage (2 V, 20 V, 200 V, 250 V), resistance (200 Ω , 2 k Ω , 20 k Ω , 200 k Ω , 2 M Ω , 20 M Ω). Includes carrying case, batteries, test leads and instruction manual. The 3.5-ounce DM78A is a scant 4.25" x 2.13" x .5".



204X750 DM78A Pocket-Sized DMM.....1-5, \$35.95 ea.; 6-up, \$34.50 ea.

Model DM-73A

Small, Portable Pen-Type DMM

- Simple, one-handed operation
- Continuity beeper with data hold convenience
- Handy small size and moderate price

Designed for easy carrying, simple use and convenient access to tight spots, the DM-73A is among the smallest DMMs on the market. It mea-

WAVETEK

Model DM-73A Specifications

Measurement	Ranges	Measurement Range
Volts ac	4	2 V-250 V
Volts dc	5	200 mV-500 V
Ohms	4	2 k Ω -2 M Ω

sures dc/ac voltage, resistance and continuity. The 3.5-digit LED displays value, polarity, overrange, autorange and low-battery information.

This lightweight, probe-type meter is easily operated with one hand, allowing full concentration on measurements. The data hold button keeps readings on the display for later evaluation. Includes test lead pair, two 1.5-volt batteries, two fuses and manual. The unit is 5.2" x 1.1" x .6" and weighs 2.4 ounces including battery. One-year warranty.

204X746 DM-73A Probe-Type DMM.....1-5, \$69.95 ea.; 6-up, \$66.50 ea.

204X010 VC-10 Carrying Case.....6.00 ea.

Digital Pen DMM

3.5-Digit Multimeter with Logic

- DMM doubles as a logic test pen
- Automatically or manually change measurement ranges

This pen-form digital multimeter offers perfect performance with .5% dc accuracy. An eight-function DMM with logic tester, it features a large 3.5-

EXTECH
INSTRUMENTS

381625 Specifications

Measurement	Ranges	Measurement Range
Volts (dc)	5	200 mV-500 V
Volts (ac)	4	2 V-500 V
Current (dc/ac)	1	200 mA
Resistance (Ω)	6	200 Ω -20 M Ω
Diode	1	1.5 V
Continuity Test	1	<1 k Ω
Logic Test	1	4-16 V (2-20 mA)

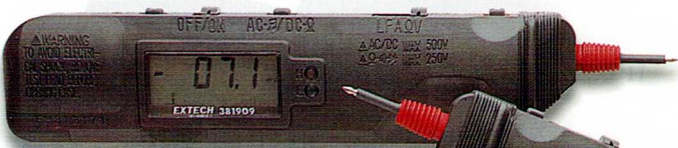
digit LCD with full function indication. This is an ideal instrument for use in the field, factory, college or laboratory. A precision electronic instrument, it is easily operated. All range overload protection is provided.



Measure ac/dc voltages, ac/dc current, resistance and diode. This DMM also can be used as a logic test pen. The wide measuring ranges can be changed automatically or manually. All measuring results are displayed with 15-mm height characters and full parameter symbols. The buzzer sounds after turning on power switch, function switch position changing, over range generating, range setting and continuity testing.

Includes test lead clip and power leads, two 1.5-V button cells and manual. The 7.3" x 1" x 1.2" unit weighs less than a pound. One-year warranty.

160X195 381625 Pen DMM.....1-9, \$49.00 ea.; 10-up, \$45.00 ea.



Model 381909

Dual-Display Pen MultiMeter with Frequency and Logic Test

- Data hold
- CMOS/TTL logic test
- Analog bar graph — 32 segments
- Auto/manual range selection

The rugged 381909 is a pen DMM with dual 3200-count LCDs that display ac/dc volts, current and frequency. This is the perfect meter for both left- and right-handed users because it has an LCD readout on each side of the unit. A large display is always easy to read — even if you switch hands. Model 381909 is very useful for a variety of applications including troubleshooting pc boards, TVs and all digital and analog circuits.

Features include data hold, CMOS/TTL logic test and 32-segment analog bar graph. Push-button operation simplifies autorange/manual range

EXTECH
INSTRUMENTS

381909 Specifications

Measurement	Ranges	Measurement Range
Volts (dc)	5	300 mV-500 V
Volts (ac)	4	3 V-500 V
Current (dc/ac)	2	30 mA-300 mA
Resistance (Ω)	6	300-30 M
Frequency (Hz)	4	3 k-3 M
Logic Test	Working voltage 4-16 V (input current 2-20 mA) Pulse response — frequency max 2 MHz, width 1 μ s	

selection. Autoranging provides convenience when the operating range is unknown. Other features include diode and audible continuity test. All ranges are protected by 800-mA/250-V fuse and PTC. You can measure frequency in low voltage circuits. Indications for function, auto polarity, overrange and low battery are provided.

Includes test leads, power leads with two alligator clips for logic test and two 1.5-volt button cells. This 6.9-ounce meter measures 7" x 1.5" x .75". One-year warranty.

160X209 381909 Pen DMM.....1-5, \$69.00 ea.; 6-up, \$63.50 ea.



FLUKE

Fluke Multimeter Accessories

Specialized Products Co. offers the largest selection of digital multimeter accessories available anywhere. These useful products are designed to work with all DMMs including but not limited to Fluke, Wavetek, Exttech, B&K, Tektronix, Soar, Protek, Amprobe and AW Sperry.

High-Current Accessories

A. 80J-10 Current Shunt: Precision .01- Ω current-sensing resistor will pass 10 A continuously and 20 A for one minute. Accuracy is $\pm 0.25\%$ from dc to 10 kHz. For all Fluke DMMs.

045X020 80J-10 Current Shunt\$65.00 ea.

B. Y8101A Current Probe: Measures ac current from 2 A to 150 A. Division ratio is 1000 to 1. Clamps over conductors to 1.1 cm ($7/16"$) in diameter. Accuracy is $\pm 2\%$ of reading from 48 Hz to 10 kHz for 10 A to 150 A currents. Compatible with all Fluke DMMs.

045X980 Y8101A Current Probe\$79.00 ea.

C. Y-8100 AC/DC Clamp-On Current Probe: Battery-powered Hall-effect clamp-on probe with switch-selectable 200-A or 20-A current range. Produces 2-V full-range output. For conductors to 0.75" (19 mm). Accuracy is $\pm 2\%$ of range from dc to 200 Hz.

045X979 Y-8100 Current Probe\$319.00 ea.

D. 80i-600A Current Clamp: Measures ac current from 1 A to 600 A. Division ratio is 1000 to 1. Clamps over conductors to 5 cm (2") in diameter. Accuracy is $\pm 3\%$ from 30 Hz to 1 kHz. Compatible with all Fluke DMMs.

045X010 80i-600A Current Clamp\$119.00 ea.

E. 80I-400 Current Clamp: Measures ac current from 1 A to 400 A. Division ratio is 1000 to 1. Clamps over conductors to 1.2 inches x 2.0 inches (including up to two 500 MCM [.955"] THHN wires). Accuracy is $\pm 3\% \pm .4$ A. Compatible with all Fluke DMMs.

045X009 80I-400 Current Clamp\$83.00 ea.

F. 80I-410 AC/DC Clamp-On Current Probe: Battery-powered Hall-effect clamp-on probe for conductors up to 1.18 inches. Output is 1 mV per amp dc or ac. Accuracy $\pm (5\% + 2.5$ A) to 400 A, dc to 62 Hz. Usable to 400 Hz. Compatible with all Fluke DMMs.

045X013 80I-410 Current Probe\$179.00 ea.

G. 80I-1010 Clamp-On Current Probe: Battery-powered clamp-on for conductors up to 1.18 inches. Output is 1 mV per amp dc or ac. Measures dc current to 1000 A and ac current to 700 A. Accuracy is $\pm 2-5\%$ (depending on range). Compatible with all Fluke DMMs.

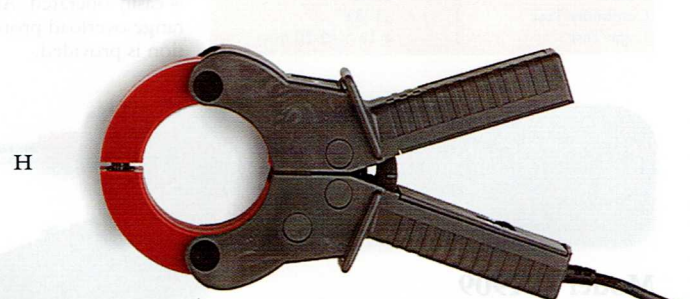
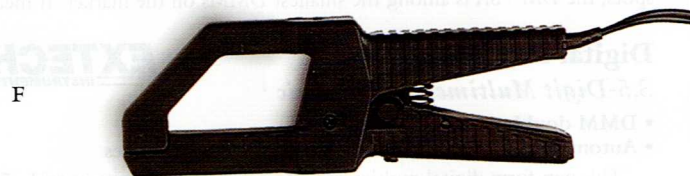
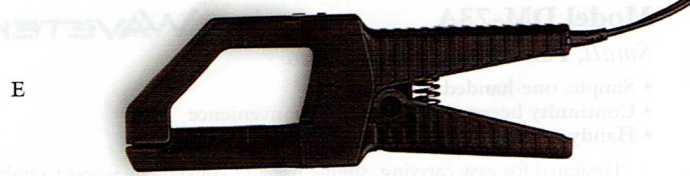
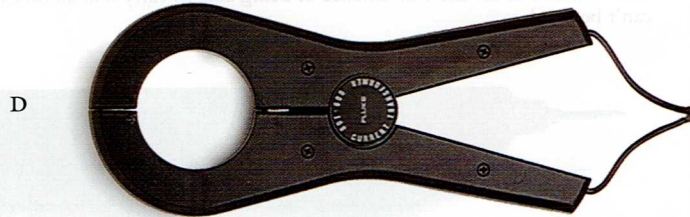
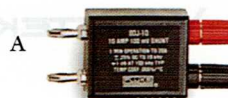
045X011 80I-1010 Current Probe\$297.00 ea.

H. 80i-1000s AC Clamp-On Current Probe: Capture and display current measurements on the spot as high-resolution waveforms on an oscilloscope. Safety rating to 600 V with 1000-A ac current capacity to capture peak currents. Built-in 100-kHz low pass filter eliminates high-frequency noise. This 20-ounce probe measures 7" x 1.3" x 4" and is compatible with most scopes.

045X014 80i-1000s Current Probe\$395.00 ea.

I. 80i-kW Current/Power Probe: Battery-powered, clamp-on probe measures dc current, ac current and ac power. Two removable jaws activated by trigger mechanism in handle. Each jaw contains half a magnetic core. Jaws clamp around a conductor (up to 2.88" x 2.38") to measure without breaking the circuit. Measures dc current to 1300 A with accuracy of 2% to 700 A, 3% for 700-1000 A and 4% for 1000-1300 A. Measures ac current to 1000 A with accuracy (dc for 26 Hz) of 2% to 500 A, 3% for 500-700 A and 8% for 700-1000 A. The 1.8-pound 80i-kW is 11.75" x 1.5". Includes battery, test leads, manual and carrying case for 80i-kW, DMM, test leads and manuals. Compatible with all Fluke DMMs.

045X015 80i-kW Current/Power Probe\$599.00 ea.



High-Voltage Accessories

A. 80K-6 High-Voltage Probe: Division ratio of 1000 to 1 extends voltage measurement of DMM to 6000 V dc or peak ac. Accuracy is +1% dc to 500 Hz; +2%, 500 Hz to 1 kHz. Compatible with all Fluke DMMs.

045X018 80K-6 High-Voltage Probe\$65.00 ea.

B. 80K-40 High-Voltage Probe: Division ratio of 1000 to 1 extends DMM voltage to 40 kV dc or 28 kV rms ac. Has 1000-M Ω input resistance; dc accuracy is +2% from 20 to 30 kV and decreases linearly to +4% at 1 kV and 40 kV. Accuracy is +5% at 60 Hz. Compatible with all Fluke DMMs.

045X030 80K-40 High-Voltage Probe\$119.00 ea.

Temperature Accessories

C. 80TK Temperature Module: Low-cost temperature module allows selection of C or F output scaling. Output may be read on any DMM with 10-M Ω or greater input impedance and 3.5-digit display. Bead-type probe for general-purpose applications (not liquid immersion) reads -40° to 260° C (-40° to 500° F). Accuracy is .5%-2.5%. Utilizes a variety of specialty probes for different applications (see below). Compatible with all Fluke DMMs.

045X051 80TK-K Temperature Module\$69.00 ea.

D. 80T-150U Universal Temperature Probe: Self-contained temperature-to-voltage converter converts digital multimeter to thermometer. Switch selectable between Celsius (-50° to 150° C) and Fahrenheit (-58° to 302° F). Powered by standard 9-V battery. Compatible with all Fluke DMMs.

045X046 80T-150U Temperature Probe\$120.00 ea.

Temperature Probes

E. 80PK-1 Bead Probe: Originally supplied with 80TK Temperature Module. For all general-purpose applications (not liquid immersion).

045X034 80PK-1 Bead Probe\$12.00 ea.

F. 80PK-2A Immersion Probe: For liquids and gels. Protected from tip to handle by an Iconel sheath, use it in most general temperature measurement applications. Measurement range: -196° to 927° C (-320° to 1700° F).

045X035 80PK-2A Immersion Probe\$46.00 ea.

G. 80PK-3A Surface Probe: For flat or convex surfaces. Ideal for measuring hot rollers or plates. Measurement range: -28° to 260° C (-18° to 500° F).

045X036 80PK-3A Surface Probe\$85.00 ea.

H. 80PK-6A Exposed Probe: Exposed bead attached to 6-inch sheath for general-purpose and surface measurements. Measurement range: -196° to 816° C (-320° to 1500° F).

045X039 80PK-6A Exposed Probe\$65.00 ea.

I. 80PK-5A Piercing Probe: 316-type stainless steel is suitable for food service, liquids and gels. Range: -196° to 816° C (-320° to 1500° F).

045X038 80PK-5A Piercing Probe\$58.00 ea.

J. 80PK-4A Air Probe: For air and gases. Measuring bead is protected by perforated stainless steel baffle. Not for immersion in liquid. Measurement range: -196° to 816° C (-320° to 1500° F).

045X037 80PK-4A Air Probe\$64.00 ea.

RF Probes

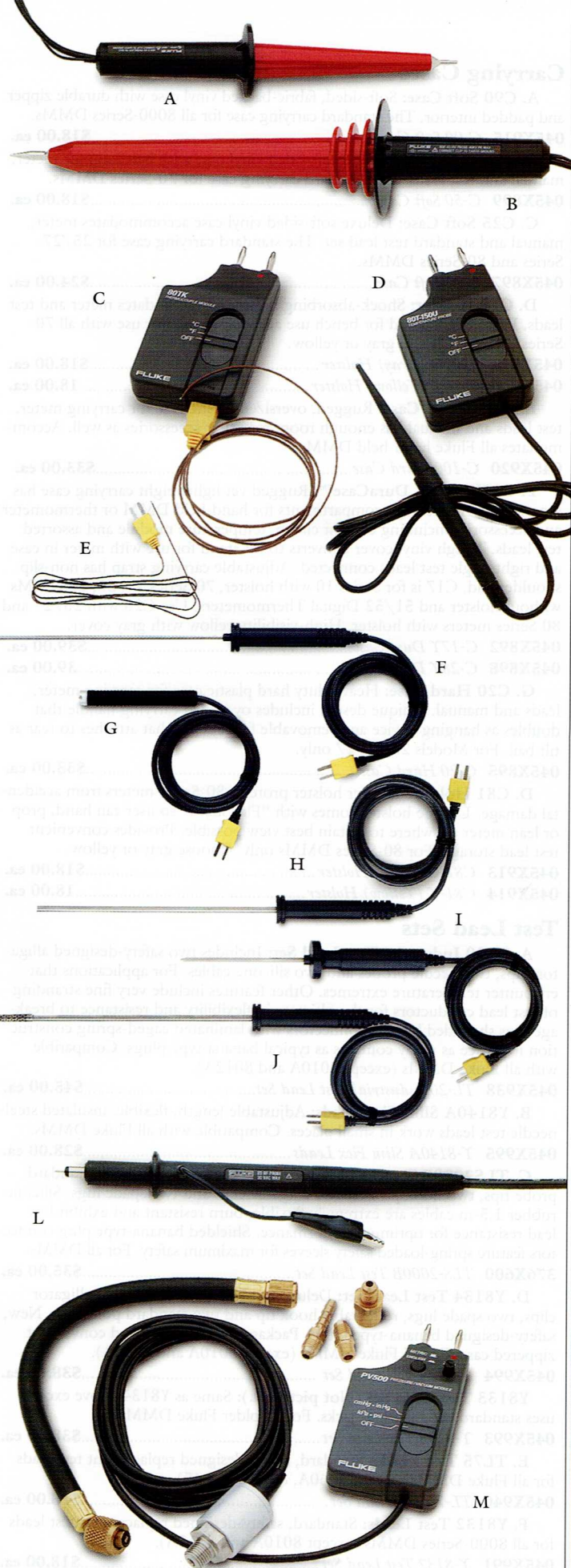
L. 85RF RF Probe: Same as 83RF except better accuracy: +0.5 dB for inputs > 0.5 V. Useable to 500 MHz. Compatible with all Fluke DMMs.

045X077 85-RF Probe\$99.00 ea.

Pressure-Vacuum Modules

M. PV350/PV500 Digital Pressure-Vacuum Modules: Turn your DMM into a complete measuring system for pressure-vacuum troubleshooting. Each versatile, reliable, rugged module plugs into standard diameter banana jacks on front of meter. Model PV350 measures pressure to 500 psi; use the PV500 for pressure measurements to 600 psi. Each single portable unit measures vacuum to 29.99" Hg with 1% accuracy. Convert measurement to millivolt-per-unit reading and display results in English or metric. State-of-the-art, solid-state pressure transducer sealed in 316 stainless steel is compatible with most refrigerants, gases, fluids and popular DMMs. Use with Fluke 25 or 87 to record Min/Max values. Includes connector, adapter, 8-foot PVC cable, 9-volt battery and manual. One-year warranty.

044X945 PV350 Pressure-Vacuum Module\$269.00 ea.



Carrying Cases

A. C90 Soft Case: Soft-sided, fabric-backed vinyl case with durable zipper and padded interior. The standard carrying case for all 8000-Series DMMs.

045X915 C-90 Soft Case\$18.00 ea.

B. C50 Soft Case: Deluxe soft-sided vinyl case with belt loop for meter, manual and test leads. The standard carrying case for 70-Series DMMs.

045X899 C-50 Soft Case\$18.00 ea.

C. C25 Soft Case: Deluxe soft-sided vinyl case accommodates meter, manual and standard test lead set. The standard carrying case for 25/27-Series and 80-Series DMMs.

045X897 C-25 Soft Case\$24.00 ea.

D. C70 Holster: Shock-absorbing holster accommodates meter and test leads. Features tilt stand for bench use and belt hook. For use with all 70-Series DMMs. Choose gray or yellow.

045X911 C-70G (Gray) Holster\$18.00 ea.

045X910 C-70Y (Yellow) Holster18.00 ea.

E. C100 Hard Case: Rugged, oversized plastic case for carrying meter, test leads and manual has enough room for other accessories as well. Accommodates all Fluke hand-held DMMs.

045X920 C-100 Hard Case\$33.00 ea.

F. C17Y/C28Y DuraCase™: Rugged yet lightweight carrying case has separate internal storage compartments for hand-held DMM or thermometer and accessories including current clamp, temperature module and assorted test leads. Tough vinyl cover converts to tilt stand for use with meter in case and right-angle test leads connected. Adjustable carrying strap has non-slip shoulder pad. C17 is for Series 10 with holster, 70 Series 21, 23, 29 DMMs without holster and 51/52 Digital Thermometers. Use C28 with 25/27 and 80 Series meters with holster. High-visibility yellow with gray cover.

045X892 C-17Y DuraCase\$39.00 ea.

045X898 C-28Y DuraCase39.00 ea.

G. C20 Hard Case: Heavy-duty hard plastic case for carrying meter, leads and manual. Unique design includes oversized carrying handle that doubles as hanging device and removable front cover that attaches to rear as tilt bail. For Models 25 and 27 only.

045X895 C-20 Hard Case\$33.00 ea.

D. C81 Holster: Rubber holster protects 80-Series meters from accidental damage. Unique holster comes with "FlexStand" so user can hand, prop or lean meter anywhere to obtain best view possible. Provides convenient test lead storage. For 80-Series DMMs only. Choose gray or yellow.

045X913 C81-G (Gray) Holster\$18.00 ea.

045X914 C81-Y (Yellow) Holster18.00 ea.

Test Lead Sets

A. TL20 Industrial Test Lead Set: Includes two safety-designed alligator clips, two needle probes and two silicone cables. For applications that encounter temperature extremes. Other features include very fine stranding of test lead conductors for the ultimate in flexibility and resistance to breakage plus shrouded banana connectors with laminated caged-spring construction for twice as many contacts as typical banana-type plugs. Compatible with all Fluke DMMs (except 8010A and 8012A).

045X938 TL-20 Industrial Test Lead Set\$45.00 ea.

B. Y8140A Slim-Flex Leads: Adjustable length, flexible, insulated steel-needle test leads work in small places. Compatible with all Fluke DMMs.

045X995 Y-8140A Slim Flex Leads\$28.00 ea.

C. TLS2000B Test Lead Set: Professional kit includes two standard probe tips, two hook probes, two alligator clips and two spade lugs. Silicone rubber 1.5-m cables are extremely flexible, burn resistant and exhibit low lead resistance for optimum performance. Shielded banana-type plug connectors feature spring-loaded safety sleeves for maximum safety. For all DMMs.

376X600 TLS-2000B Test Lead Set\$35.00 ea.

D. Y8134 Test Lead Set: Deluxe test lead kit includes two alligator clips, two spade lugs, retractable hook tip and two standard point tips. New, safety-designed banana-type plugs. Packaged in attractive and convenient zippered case. For all Fluke DMMs (except 8010A and 8012A).

045X994 Y-8134 Test Lead Set\$38.00 ea.

Y8133 Test Lead Set (Not pictured.): Same as Y8134 above except uses standard banana input jacks. For all older Fluke DMMs.

045X993 Y-8133 Test Lead Set\$38.00 ea.

E. TL75 Test Leads: Standard, safety-designed replacement test leads for all Fluke DMMs (except 8060A, 8062A and 45).

045X940 TL-75 Test Lead Set\$10.00 ea.

F. Y8132 Test Leads: Standard, safety-designed replacement test leads for all 8000-Series DMMs (except 8010A and 8012A).

045X991 Y-8132 Test Lead Set\$18.00 ea.

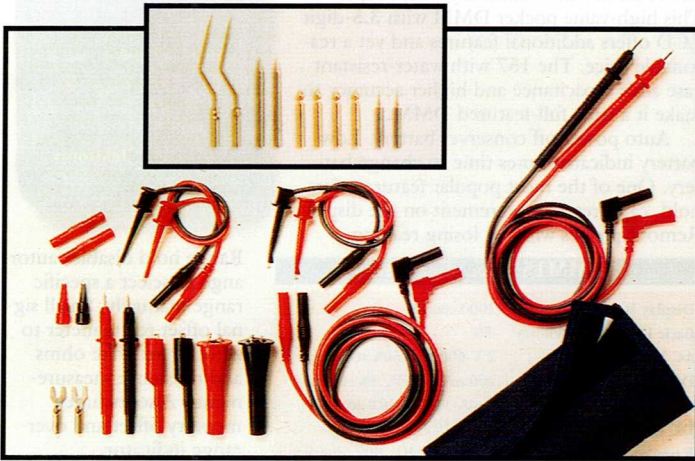


Deluxe Test Lead Kits

Upgrade Your Factory Original Multimeter Test Leads

Simply the best. That's the best way to describe Pomona's deluxe test lead kits. You know Pomona, they've been supplying the highest quality, easiest to use test accessories to the electronics industry for almost 40 years. Now they've taken all that knowledge and experience and designed the most complete line of digital multimeter test leads to be found anywhere.

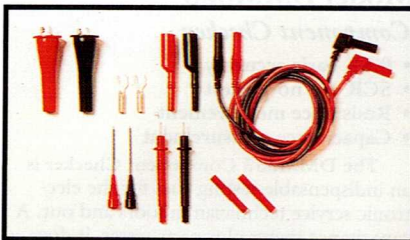
Examine for yourself the many exclusive features that these kits offer to assure accurate readings and extend the life of those vital links between the product under test and your digital multimeter.



Maxi-Kit — Here's the ultimate test lead kit. The very best selection of accessories includes all silicone insulated test leads, two extendible tip test probes, replaceable tip probe handle set of two, 10 (five sets of two each) Pop-Jack interchangeable tips and Minigrabber/Minipincer extensions, two slide-on IC leg test tips, two sleeved 90° multimeter safety-designed test leads and 10 replaceable tips. All this comes in a sturdy, Velcro-sealable nylon pouch that securely holds every part in its place.

630X930 5677A Maxi-Kit1-9, \$89.50 ea.; 10-up, \$80.50 ea.

Heavy-Duty Kit — The right assortment of accessories for the unique requirements of primarily electrical testing (plant, HVAC/R and general electrical/utility applications). Includes two each high-retention Pop-Jack style insulated battery clips, insulated alligator clips, spade lug silicone-insulated multimeter test leads with sleeved 90° plugs, Pop-Jack probe handles, slide-on extended tips and a pair of banana couplers. Packaged in a convenient nylon pouch.



630X924 5673A Heavy-Duty Kit1-9, \$45.00 ea.; 10-up, \$40.50 ea.

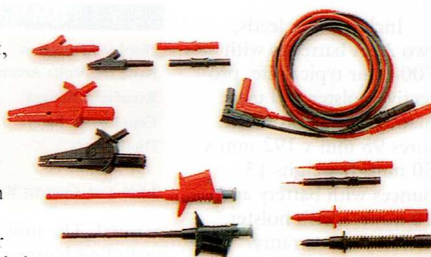
Model 6112 Test Companion™

Fluke 80 Series DMM Test Kit

Use the fully configured 6112 Test Companion™ with Fluke 80 Series DMMs. The large briefcase-style Cordura carrying case with shoulder strap holds and protects the included Pomona test accessories plus your DMM, manuals, references and miscellaneous items. Includes DMM test lead set, probe bodies with banana plug tip, flexible Grabber® test clips, large safety alligator clips, medium alligator clips, minispring needle tips and splices.

The rugged, lightweight case's interior features sturdy, easy-view pockets trimmed in Cordura. Grab your meter without putting the case down, or use the full-length zipper to lay it flat for full access. The 2.5-pound kit measures 13.5" x 16.5" x 4.5". Accessories come with one-year warranties; the case has a 90-day warranty. *DMM not included.*

630X990 6112 Test Companion Kit1-5, \$220.00 ea.; 6-up, \$198.00 ea.



Silicon Insulation

Much more pliable and easier to handle than conventional PVC insulation, these test leads are virtually impervious to being burned or melted by a hot soldering iron accidentally!

Interchangeable Probes and Clips

Pomona's exclusive "Pop-Jack" connector connects the silicone-insulated wire to a variety of probes and clips. They connect smoothly and very securely without a keyway or threading!

Field Repairable

By simply unscrewing the threaded cap on the probe handle, broken or intermittent test leads can be easily repaired in the field in a matter of seconds — with complete assurance of signal integrity!

Low-Cost "Slide-On" Tips

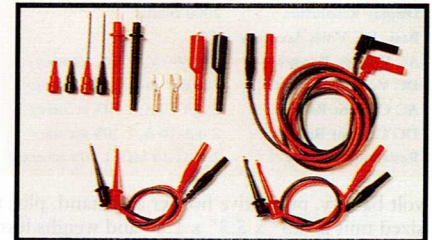
Pomona provides an economical alternative to the tangle of seldom-used special-purpose probes with a complete selection of slide-on tip styles. Simply select the desired tip and slide it right over the standard probe tip!

Available in four great kits, there's a Pomona Deluxe Test Lead Kit designed especially for you.

ITT POMONA Electronics

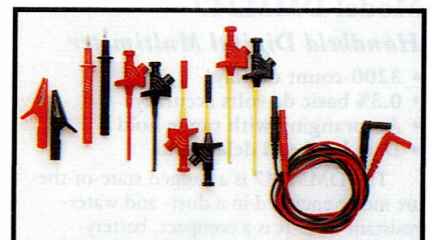
Deluxe General-Purpose Kit — This kit is ideally suited for the total electronic testing of conventional or solid-state/IC circuitry. Our deluxe kit includes two silicone-insulated multimeter test leads with 90° sleeved plugs and Pop-Jack connectors, two Minigrabbers, two Minipincer clips, two probe handles, two alligator clips, two spade lugs, two slide-on IC leg tips and two extended tips. All components are packaged in a deluxe nylon pouch for convenient and easy storage.

630X926 5674A Deluxe Kit1-9, \$67.50 ea.; 10-up, \$61.00 ea.



Deluxe Electrical Kit — This handy kit contains red and black six-piece sets of both probes and adapters. Model 5904 includes probe handles, right angle to straight plug test leads, flexible Maxigrabber® test clips, rigid Maxigrabber® test clips, Maxigrabber® grip clips and extra large jaw alligator clips. The 12-piece Deluxe Electrical Kit comes in a deluxe nylon pouch.

630X983 5904 Deluxe Kit1-9, \$89.00 ea.; 10-up, \$80.00 ea.



ITT POMONA Electronics



Model DMM155**Handheld Digital Multimeter**

- 2000-count display
- 0.7% basic accuracy
- Autoranging or manual selection
- Data hold
- Current measurement

The DMM155 is designed for indoor/outdoor service of electrical equipment. A compact, autoranging, battery-powered personal DMM, it has functions to satisfy the needs of most hobbyists. This full-featured handheld TekTool with 3.5-digit LCD offers high value for a low price. It measures ac/dc voltage, ac/dc current, resistance, diodes and continuity with beeper.

Auto power off conserves battery, and low battery indicator notes when to change battery. One of the most popular features, data hold, captures a measurement on the display. Probes can be removed without losing reading. Range hold disables autor-

DMM155 Specifications

Display Resolution	2000 counts
Basic DC Volts Accuracy	.7%
AC Voltage Ranges	2 V-600 V, 1.70% accuracy
DC Voltage Ranges	200 mV-600 V, .7% accuracy
AC Current Ranges	2 mA-10 A, 1.70% accuracy
DC Current Ranges	2 mA-10 A, 1.20% accuracy
Resistance Ranges	200 Ω -20 M Ω , 1.20% accuracy

ange to select a specific range manually. Small signal offset resets meter readings to zero for accurate ohms and resistance measurements. Other features include memory offset and overrange indicator.

Includes test leads, 9-

220X195 DMM155.....1-5, \$75.00 ea.; 6-up, \$71.25 ea.

Tektronix**Model DMM247****Handheld Digital Multimeter**

- 3200-count display
- 0.3% basic dc volts accuracy
- Autoranging with range hold
- Data hold and delay hold

The DMM247 is a rugged state-of-the-art meter enclosed in a dust- and water-resistant case. It is a compact, battery-powered instrument. Use it to measure ac/dc voltage, ac/dc current, resistance, continuity and diodes.

This handheld model features a 3200-count LCD, analog display, overrange indicator and beep guard. The continuity check beeper sounds if resistance is $\leq 30 \Omega$. Data hold captures the measurement on the display. Other features include delay hold and overload protection. Auto power off conserves battery after 10 minutes of non-use. The low-battery indicator notes when it is time to change the battery.

DMM247 Specifications

DC Volts	300 mV-1000 V
DC Volts Accuracy	$\pm(0.3\% \text{ of reading} + 2 \text{ counts})$
AC Volts	3-750 V
Frequency Response	3-V range: 40-300 Hz Other ranges: 40-500 Hz
AC Volts Accuracy	$\pm(0.3\% \text{ of reading} + 5 \text{ counts})$
DC/AC Current	300 μ A-20 A
Resistance	300 Ω -30 M Ω
Resistance Accuracy	$\pm(1.2\% \text{ of reading} + 4 \text{ counts})$

220X217 DMM247.....1-5, \$155.00 ea.; 6-up, \$149.00 ea.



Includes test leads, two AAA batteries with 700-hour typical life, protective holster and user manual. The unit measures 95 mm x 192 mm x 50 mm. It weighs 13 ounces with battery and 20 ounces with holster. Three-year warranty.

Model DMM157**Handheld Digital Multimeter**

- 2000-count display
- 0.5% basic accuracy
- Autoranging or manual selection
- Low battery indicator
- Current and capacitance measurement

Model DMM157 is ideal for the service technician or student needing a rugged, multifunction meter with good accuracy. Like the 155, this autoranging model measures ac/dc voltage, ac/dc current, resistance, diodes and continuity with beeper. This high-value pocket DMM with 3.5-digit LCD offers additional features and yet a reasonable price. The 157 with water-resistant case adds capacitance and higher accuracy to make it a truly full-featured DMM.

Auto power off conserves battery. Low battery indicator notes time to change battery. One of the most popular features, data hold, captures a measurement on the display. Remove probes without losing reading.

DMM157 Specifications

Display Resolution	2000 counts
Basic DC Volts Accuracy	.5%
AC Voltage Ranges	2 V-600 V, 1.50% accuracy
DC Voltage Ranges	200 mV-600 V, .5% accuracy
AC Current Ranges	2 mA-10 A, 1.50% accuracy
DC Current Ranges	2 mA-10 A, 1% accuracy
Resistance Ranges	200 Ω -20 M Ω , .80% accuracy
Capacitance Ranges	2 μ F-200 μ F, 1.90% accuracy

holster and stand plus user manual. The 6.5" x 3.3" x 1.5" unit weighs under a pound including battery and holster. Three-year warranty.

220X199 DMM157.....1-5, \$99.00 ea.; 6-up, \$95.00 ea.



Range hold disables autorange to select a specific range manually. Small signal offset resets meter to zero for accurate ohms and resistance measurements. Also includes memory offset and overrange indicator.

Includes test leads, 9-volt battery, protective holster and stand plus user manual. The 6.5" x 3.3" x 1.5" unit weighs under a pound including battery and holster. Three-year warranty.

Model DMM353**Component Checker**

- 0.5% basic accuracy
- SCR go/no-go test
- Resistance measurement
- Capacitance measurement

The DMM353 Component Checker is an indispensable testing tool for the electronic service technician indoors and out. A capacitance meter plus parts tester, it does more than a capacitance-only meter. This dust- and water-resistant model is designed for field service or bench applications.

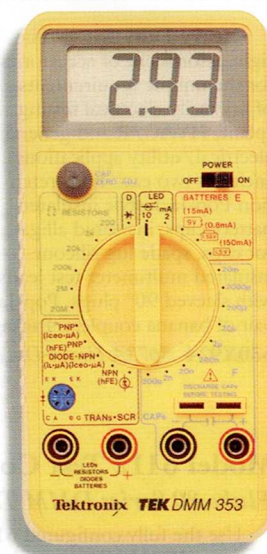
Model DMM353 has several ranges for versatility. Use it to test capacitance, resistance, continuity with beeper, diodes, trimmers, VRs, LEDs, transistors, SCRs, batteries and more. It features a 3.5-digit LCD, overrange indicator, overload protection (fused) and capacitance zero adjustment. Use dual input jacks for direct insertion of capacitors. Measure larger capacitors with standard test

DMM353 Specifications

Display Resolution	2000 counts
Basic DC Volts Accuracy	.50%
Resistance Ranges	200 Ω -20 M Ω , .50% accuracy
Capacitance Ranges	200 pF-20 mF
Diode Test	$\pm 1.5\% \text{ of reading} + 5 \text{ count accuracy}$
LED Test Current Ranges	0-2 mA; 0-10 mA

manual. The unit is 84 mm x 175 mm x 31 mm and weighs under a pound including battery. Three-year warranty.

220X250 DMM353.....1-5, \$110.00 ea.; 6-up, \$104.50 ea.



leads. Other features include auto power off, autoranging with range hold and data hold. The DMM353 updates two times per second.

Includes right-angle test leads, spare fuse, 9-volt battery and operator's



Model DMM249

Handheld Digital Multimeter

- True rms version
- 3200-count display
- 0.3% basic dc volts accuracy
- Autoranging with range hold
- Data hold and delay hold

The DMM249 Personal Multimeter is a rugged state-of-the-art meter enclosed in a dust- and water-resistant case. Use this compact, battery-powered instrument to measure ac/dc voltage, ac/dc current, resistance, continuity and diodes. Model DMM249 also provides true-rms measurement for accuracy in the presence of harmonics.

This handheld model features a 3200-count LCD, analog display, overrange indicator and beep guard. A continuity checker beeper sounds if resistance is $\leq 30 \Omega$. The data hold function captures the measurement on the display. Other useful features of the DMM249 include delay hold and overload protection. Auto power off conserves the battery after 10 minutes of non-use. The low-battery indicator notes when it is time to change the battery.



Tektronix

DMM249 Specifications

DC Volts	300 mV-1000 V
DC Volts Accuracy	$\pm(0.3\% \text{ of reading} + 2 \text{ counts})$
AC Volts	3-750 V
Frequency Response	3-V range: 40-300 Hz Other ranges: 40 Hz-1 kHz
AC Volts Accuracy	$\pm(0.3\% \text{ of reading} + 3 \text{ counts})$
DC/AC Current	300 μ A-20 A
Resistance	300 Ω -30 M Ω
Resistance Accuracy	$\pm(1.2\% \text{ of reading} + 4 \text{ counts})$

Includes test leads, one 9-volt battery with 350-hour typical life, protective holster and user manual. The unit measures 95 mm x 192 mm x 50 mm. It weighs 13 ounces with battery and 20 ounces with holster. Three-year warranty.

DMM249

220X219.....1-5, \$195.00 ea.; 6-up, \$188.00 ea.

118-8338-01 Soft Carrying Case

220X030\$25.00 ea.

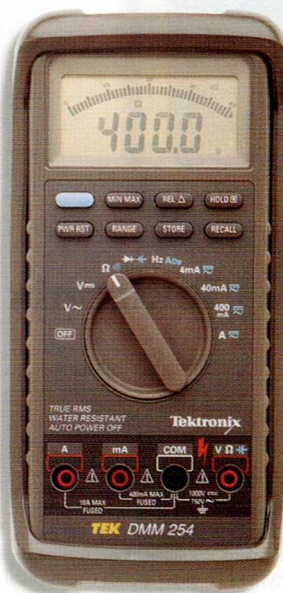
Model DMM252 and DMM254

Professional Handheld Digital Multimeters

- 4000-count autoranging
- Analog bar graph
- Data hold and range hold
- Frequency measurement
- 0.1% basic accuracy
- Capacitance test

When multiple functions and extreme accuracy are required, Tektronix multimeters are the answer. These compact, handheld and battery operated test instruments are designed for easy portability. Use them for field service, laboratory work, testing appliances and electronic hobby needs. Each water-, dust- and impact-resistant meter's safety features give a high level of operator protection. All measurements are made with a high degree of accuracy and resolution. Functions include digital/analog meter, frequency counter, recorder and capacitance tester. Measure ac/dc voltage, ac/dc current, resistance, diodes and continuity with beeper. The DMM254 also provides true-rms measurement for accuracy in the presence of harmonics.

Tektronix state-of-the-art DMMs offer many features required by the serious professional. Measurements are easy to read at a glance on the large digital readout. Each meter has a 42-segment analog bar



graph and mode indicators. The analog bar graph display gives a true simulation of an analog meter and is great for detecting peaks, nulls and trends. Auto power off after 30 minutes preserves battery life. The low battery indicator function notes when to change the batteries. Data hold instantaneously captures and locks a measurement on the display.

The memory function stores a reading that can be recalled later. Use the relative reference function to store a reading in memory and show the difference between it and any future readings. Min/max captures and stores minimum and maximum readings. Monitor a signal for seconds or days and record the high and low values.

Offset turns base settings of reading to zero. Range hold causes the meter to exit autorange mode and keeps it in the selected range. Use adapt measurement mode for accuracy when measuring small voltages up to 400 mV. Other features include overrange indicator, relative reference and large rotary switch.

Choose from two models. Each safety certified unit measures 185 mm x 86 mm x 32 mm. It weighs less than 13 ounces with batteries and 21 ounces with holster. Three-year warranty.

Model DMM252

The DMM252 is an extended-function DMM designed for the professional with tight accuracy requirements. This model comes complete with test leads, protective holster, two 1200-hour AAA batteries and manual. The optional case fits with holster removed.

DMM252

220X226.....1-5, \$235.00 ea.; 6-up, \$226.00 ea.

118-8338-01 Soft Carrying Case

220X030\$25.00 ea.

Tektronix

DMM252/254 Specifications

Display Resolution	4000 counts
Basic DC Volts Accuracy	.1% (except 400-mV range)
AC Voltage Ranges	400 mV-750 V, .50% accuracy
DC Voltage Ranges	400 mV-1000 V, .1% accuracy
AC Current Ranges	4 mA-10 A, .60% accuracy
DC Current Ranges	4 mA-10 A, .40% accuracy
Resistance Ranges	400 Ω -40 M Ω , .40% accuracy
Capacitance Ranges	4 nF-40 μ F, 1% accuracy
Frequency Ranges	100 Hz-1 MHz, .10% accuracy

Model DMM254

This version is designed for the professional who needs full-function capabilities with exceptional accuracy. DMM254 provides true-rms measurement for accuracy in the presence of harmonics. Includes test leads, protective holster, 500-hour 9-volt battery and manual. The optional case fits with holster removed.

DMM254

220X228.....1-5, \$260.00 ea.; 6-up, \$250.00 ea.

118-8338-01 Soft Carrying Case

220X030\$25.00 ea.





Tektronix

DMM800 Series

Handheld Digital Multimeters

- 40,000-count, 4 $\frac{3}{4}$ -digit display
- True-rms ac voltage measurement
- Autoranging with manual ranging
- AC + DC setting indicates total rms value
- CE certified

The Tektronix designed high-performance DMM800 Series features three 40,000-count, 4 $\frac{3}{4}$ -digit, true-rms, autoranging, handheld digital multimeters. Models DMM830, DMM850 and DMM870 provide all the typical DMM measurements: ac/dc volts, ac/dc current, resistance, capacitance, frequency, continuity check and diode test. Standard functions include analog bargraph display, Min/Max/Avg/Min-Max, hold and auto hold. You get beep guard, continuity check/beeper, 50/60-Hz selection and memory store/recall. All models have low-battery indicator and adjustable auto power off. DMM800 Series safety symbols include EIC, UL and CSA.

Several new, innovative features allow users to do their jobs faster and easier with twice the accuracy. Most true-rms DMMs only give the true rms of the ac portion of the waveform. However, the ac + dc setting measures the total rms value including both ac and dc components.

Models DMM850 and 870 have a second numeric display in addition to the main display and analog bargraph. This can allow the user, for example, to display the amplitude and frequency of ac voltage and current waveforms simultaneously. The dual display saves the trouble of changing switch positions to make a second measurement and can provide additional information when troubleshooting. When Min/Max/Avg or Peak Hold are used, this display also acts as a timer. Then the user can correlate the timing of extreme measurements with other events.

The DMM850 and 870 offer the HI/LO Limits feature for repeating the same measurement quickly. High and low values are saved. A beep notifies the user if the present measurement is within those limits. This simplifies matching components to tighter tolerances for prototyping or quickly checking a series of test points expected to be at the same voltage. Centigrade temperature measurements are possible with the DMM850 and 870.

Choose from three versions. Each includes boot, ATL01 test leads, 9-volt battery and user manual. Large, lined, soft nylon carrying case is optional. Three-year warranty.

Model DMM830

Basic Troubleshooting DMM

Model DMM830 is the basic DMM800 Series version and the lowest priced 40,000-count, true-rms autoranging DMM on the market today. It is ideal for engineers' and technicians' troubleshooting applications. In addition to all the common features previously described, it makes voltage, current, resistance, capacitance and frequency measurements. Unique features include 0.20% basic dc volts accuracy plus digital display and analog bargraph.

Model DMM830

220X2601-5, \$199.00 ea.; 6-up, \$191.00 ea.

220X062 AC12 Large Soft Case\$37.00 ea.



Model DMM850

Mid-Range

Design Verification DMM

Tektronix's mid-range meter is the choice for engineers and technicians doing design verification. In addition to all the standard DMM800 Series features, the DMM850 measures voltage, current, resistance, capacitance, frequency and temperature. Basic dc volts accuracy is 0.10%. Other unique features are time stamp for Min/Max/Avg, delta mode with percent and duty factor. It also includes HI/LO limits, volts ac/Hz and amps ac/Hz dual numeric display as well as analog bargraph.

Model DMM850

220X2671-5, \$249.00 ea.; 6-up, \$239.00 ea.

220X062 AC12 Large Soft Case\$37.00 ea.



Model DMM870

Fully Featured

Design Qualification DMM

This is the top-of-the-line DMM800 Series model for engineers' and technicians' design qualification applications. In addition to all the standard features, the versatile DMM870 measures voltage, current, resistance, capacitance, frequency and temperature. Basic dc volts accuracy is 0.06%, compared to the industry standard 0.10%. Other unique features are time stamp for Min/Max/Avg and Peak Hold (1 ms), delta mode with percent and duty factor. It also includes HI/LO limits, dBm and dB readings, volts ac/Hz and amps ac/Hz dual numeric display plus analog bargraph. The backlight display is auto-off adjustable.

Model DMM870

220X2711-5, \$289.00 ea.; 6-up, \$278.00 ea.

220X062 AC12 Large Soft Case\$37.00 ea.



DMM800 Series Specification Comparison

	DMM830	DMM850	DMM870
Max Display	40,000 counts	40,000 counts	40,000 counts
Max DC Voltage	1000.0 V	1000.0 V	1000.0 V
Accuracy	0.20%	0.10%	0.06%
Max AC Voltage, RMS	750.0 V	750.0 V	750.0 V
Accuracy	1.00%	0.80%	0.70%
Max DC/AC Current	10.000 A	10.000 A	10.000 A
Max Resistance	40,000 M Ω	40,000 M Ω	40,000 M Ω
Accuracy	0.50%	0.40%	0.30%
Max Capacitance	40,000 mF	40,000 mF	40,000 mF
Accuracy	1.00%	1.00%	1.00%
Max Frequency	2.0000 MHz	2.0000 MHz	2.0000 MHz
Max Temperature	—	-50° C to +980° C	-50° C to +980° C



Current Probes

A. A605 500-Amp AC Current Probe: Busbar-style probe is DMM/meter current/voltage transformer. Clamp large conductors carrying high current. Measure rms ac currents ≥ 4 A and peak currents to 500 A. Voltage output: 1 mV for each amp measured. Frequency range: 48 Hz-1 kHz.

220X105 A605 500-A AC Probe1-5, \$85.00 ea.; 6-up, \$82.00 ea.

B. A610 500-Amp AC/DC Current Probe: Busbar-style probe uses Hall Effect Device current sensor to provide voltage output to DMMs. Measure rms currents ≥ 2 A and peak currents up to 500 A. Voltage output: 1 mV for each amp measured. Frequency range: dc to 440 Hz.

220X110 A610 500-A AC/DC Probe1-5, \$195.00 ea.; 6-up, \$188.00 ea.

C. A621 2000-Amp AC Current Probe: BNC industrial-strength probe with BNC to shielded banana plug adapter for use with DMMs, meters and oscilloscopes. Measure ac currents from 100 mA to peak currents up to 2000 A. Three-position sensitivity switch provides outputs of 1 mV, 10 mV or 100 mV for each amp measured. Frequency range: 5 Hz-50 kHz.

220X121 A621 2000-A AC Probe1-5, \$390.00 ea.; 6-up, \$375.00 ea.

D. A622 100-Amp AC/DC Current Probe: Long-nose-style probe uses Hall Effect Device current sensor to provide voltage output to oscilloscopes. BNC to shielded banana plug adapter included for use with DMMs and meters. Measure currents from 1 A to peak currents of 100 A. Two-position sensitivity switch provides outputs of 10 mV or 100 mV for each amp measured. Frequency range: from dc to 100 kHz.

220X125 A622 100-A AC/DC Probe1-5, \$415.00 ea.; 6-up, \$399.00 ea.

Soft Carrying Cases

A. AC11 Small DMM Soft Case: For any DMM 100/200 Series instrument with ample room for accessories and manual. Rugged tear-resistant material is lined with foam for extra shock protection.

220X060 AC11 Small DMM Case\$33.00 ea.

B. AC12 Large DMM Soft Case: For any DMM800 Series instrument with ample room for accessories and manual. Rugged tear-resistant material is lined with foam for extra shock protection.

220X062 AC12 Large DMM Case\$37.00 ea.

C. AC13 Long DMM Soft Case: For any DMM 220 ample room for accessories and manual. Rugged tear-resistant material is lined with foam for extra shock protection.

220X064 AC13 Long DMM Case\$27.00 ea.

Test Leads

A. ATLDX1 Deluxe Lead Set: A complete set of test leads and clips to cover most applications. Includes two ATL21 high-temperature silicone test leads, two ATL22 test lead tips, one red ACL22 hook-tip clip, two ACL23 wire clips and one ACL24 jaw clip.

220X084 ATLDX1 Deluxe Lead Set1-5, \$69.00 ea.; 6-up, \$66.50 ea.

B. ATL01 Basic Lead Set: Low-cost replacement for all Tektronix DMMs.

220X076 ATL01 Basic Lead Set\$9.00 ea.

Test Lead Cables, Tips and Clips

A. ATL21 Shielded Banana Plug Lead Cables: UL approved 1000 V, 10 A. Basic building block for the following test lead components. Rugged silicone maintains flexibility and operability over a wide temperature range.

220X078 ATL21 Lead Cables\$17.00 ea.

B. ATL22 Standard Test Lead Tips: UL approved 1000 V, 10 A. Rugged stainless tips plug onto ATL21 cables for a high-quality test lead set.

220X080 ATL22 Test Lead Tips\$9.00 ea.

C. ATL23 Extended Test Lead Tips: UL approved 1000 V, 5 A. Unique tips plug onto ATL21 cables and allow access to hard-to-reach test points while protecting user from electric shock. Only sharp tip is exposed.

220X082 ATL23 Test Lead Tips\$12.00 ea.

D. ACL21 Large Alligator Clips: UL approved 1000 V, 10 A. Designed for safety and durability, clips assure positive electrical connection to most electrical test points.

220X066 ACL21 Alligator Clips\$12.00 ea.

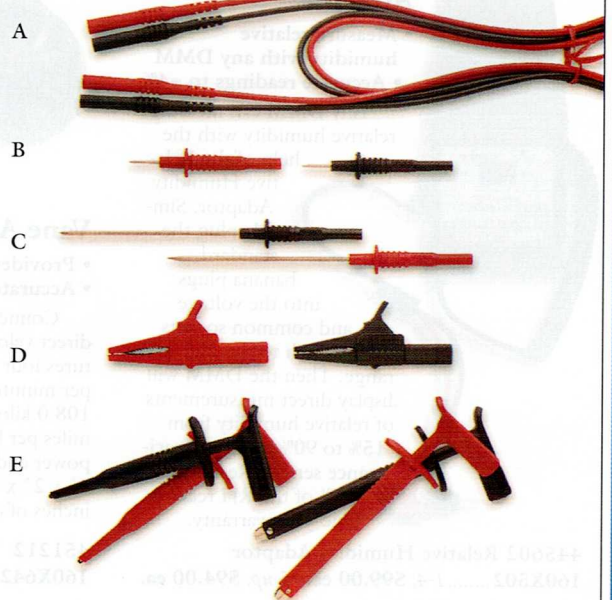
E. ACL22 Hook-Tip Clips: UL approved 1000 V, 10 A. BeCu hooks allow solid contact to most electronic test points. Fully insulated body.

220X068 ACL22 Hook-Tip Clips\$19.00 ea.

F. ACL24 Jaw Clips: UL approved 1000 V, 10 A. Jaws hold thick wire, cable, ground leads and rails for hands-free probing. Fully insulated body.

220X072 ACL24 Jaw Clips\$25.00 ea.

Tektronix





How Multimeter Adaptors Work

Adaptors convert measurements to a 1-mV-per-count linear output signal which can be displayed on ANY brand DMM or recorder having a 200-mV or 2-V input range. Higher resolution is generally obtained with the 200-mV range. Each adaptor includes battery and standard banana plugs which fit into any DMM's common and voltage sockets.

Mini AC/DC Current Clamp Adaptor

- Low-range ac/dc current-to-voltage converter
- Accurate readings from 1 mA to 200 A

Simply connect adaptor banana plugs into multimeter voltage and common sockets, clamp onto single conductor wire or cable (with jaws open to 19 mm or .75") and switch multimeter to 200-mV dc range for adaptor to display current measurements. Three adaptor output ranges of 2 A, 20 A and 200 A enable 1 mA to be displayed as 0.1 and 199.9 A as 199.9. Zero adjust provides accuracy on dc 2-A range to 1.5% of reading (ac, to 2%).

Use 388113 with a true-rms DMM to measure rectified currents or ac on dc currents. The dc-coupled input waveform appears at output jack without distortion for oscilloscope observation. Has overload protection for 500 A ac/dc and can withstand 1000 V ac for a minute between electrical circuit and housing case or metal section of transformer jaws.

Includes hand strap, banana plugs for multimeter connection, two 1.5-V batteries with estimated 90-hour continuous life and carrying case with belt strap. The 1-pound unit measures 5.9" x 2.1" x 1.2". One-year warranty.

160X263 388113 Clamp Adaptor.....1-4, \$379.00 ea.; 5-up, \$349.00 ea.



MultiMeterMate™ Probes

- 0 to 100% RH operating range
- $\pm 3\%$ RH accuracy between 20 and 80% RH at room temperature
- Less than $\pm 1\%$ RH drift per year
- Fast response time: 15 seconds (90% response)

Now you can easily and accurately measure humidity with your DMM. Vaisala's new relative humidity (RH) and relative humidity/temperature (RH/T) MultiMeterMate™ Probes provide the ultimate in convenience and accuracy. Plug a lightweight probe into virtually any DMM for an instant reading. Ideal for spot surveying in a variety of applications including storage areas, clean rooms, HVAC, process control — anywhere RH measurement is important.

These convenient, accurate probes are compatible with all DMMs capable of 1-mV resolution that accept shrouded banana plugs and have 10-M Ω minimum input impedance. Rugged and versatile sensors are interchangeable with no calibration required. The RH/T Probe offers a wide temperature measurement range of -10° to +50° C (14° to 122° F) plus measures both F° and C° with $\pm 0.4^\circ$ C ($\pm 0.7^\circ$ F) accuracy at room temperature.

Choose from two models. Each 8.5" x 1.4" x .5" unit includes a standard 9-V battery. One-year warranty.

167X100 MultiMeterMate RH.....1-5, \$ 99.00 ea.; 6-up \$ 93.00 ea.

167X200 MultiMeterMate RH/T.....1-5, 149.00 ea.; 6-up, 140.00 ea.

EXTECH INSTRUMENTS

Photo Tachometer Adaptor

- Measures rpms with your digital multimeter
- Assures precise readings to 1.2%

The Photo Tachometer Adaptor makes non-contact rpm measurements. Plug it into any DMM, switch to 200-mV range, and the DMM becomes a photo tachometer. Aim it at the target and read the rpms directly on the DMM in two ranges: 100-1999 rpms and 1000-19990 rpms. Effective working distance is 2-12 inches.

This 8-ounce unit measures 6.7" x 2.8" x 1.5". Includes four 1.5-V AA batteries, 23-inch reflecting tape and a 50-inch (1.2-m) cable with standard banana plugs. One-year warranty.

160X700 461900 Tach Adaptor.....1-4, \$109.00 ea.; 5-up, \$99.00 ea.



Relative Humidity Adaptor

- Measure relative humidity with any DMM
- Accurate readings to $\pm 4\%$

Any DMM can measure relative humidity with the help of the Relative Humidity Adaptor. Simply plug the standard banana plugs into the voltage and common sockets and switch to the 200-mV range. Then the DMM will display direct measurements of relative humidity from 15% to 90% using a capacitance sensor. Resolution is 1% of the RH reading. One-year warranty.

445602 Relative Humidity Adaptor

160X502.....1-4, \$99.00 ea.; 5-up, \$94.00 ea.



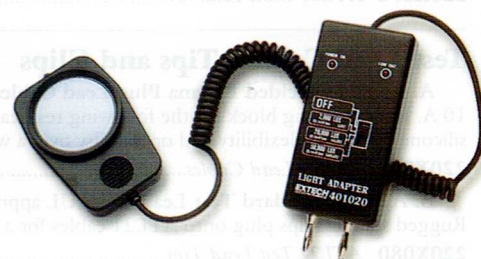
Vane Anemometer Adaptor

- Provides four velocity measurements
- Accurate readings to $\pm 2\%$

Connect the 451212 to any DMM to obtain direct velocity measurements in seconds. Features four wide measuring ranges: 80-5910 feet per minute, 0.4-30.0 meters per second, 1.4-108.0 kilometers per hour and 0.8-58.3 nautical miles per hour. Has 1-mV/count output plus power and low-battery indicators. The adaptor is 4" x 2" x 1"; the sensor is 2.8" around with 55 inches of cable. One-year warranty.

451212 Vane Anemometer Adaptor

160X642 ...1-4, \$129.00 ea.; 5-up, \$123.00 ea.



Light-Level Adaptors

- Lux and footcandle adaptors
- Accurate readings to $\pm 5\%$

These Light-Level Adaptors feature an innovative design with photo diode sensors for long life. Choose from two models to measure lux or footcandles. Each version has three wide selectable ranges. Model 401020 Lux Adaptor measures 0-50,000 lux. The 401021 Footcandle Adaptor measures 0-5000 fc. One-year warranty.

401020 Lux Adaptor

160X320.....1-4, \$59.00 ea.; 5-up, \$56.00 ea.

401021 Footcandle Adaptor

160X322.....1-4, \$59.00 ea.; 5-up, \$56.00 ea.





FLUKE



EXTECH
INSTRUMENTS



AC/DC Amp Clamp Meters

Centigrade and Fahrenheit Models

- Wide current range to 400 amps dc or ac
- 100-mA resolution
- Clamp jaws open to 2.5 inches wide
- Peak Hold and Data Hold functions
- Use any Type-K thermocouple

Designed for nuclear power plants, the 38091C/F outperforms other clamp ammeters in equipment room, utility power plant and even heating and air conditioning installation and repair applications. These full-function, 3.5-digit DMMs measure dc or ac current during motor startup. Use the Peak Hold function to recall the highest point of surge. Data Hold captures measurements for later viewing. Dual Hall effect sensors provide dc A accuracy to 2% of full scale without needing to break the circuit under test.

38091C and 38091F Specifications

Measurement	Ranges	Measurement Range
Current dc/ac	2	200-400 A
Voltage dc	3	200 mV-1 kV
Voltage ac	3	200 mV-750 V
Resistance	1	2 kΩ
Temperature C	38091C	-40 to 750° C
Temperature F	38091F	-40 to 1400° F
Overload Protection	dc/ac	1100 V dc, 800 V ac

Manual zero adjustment provides improved dc current accuracy. Measure dc and ac current and volts, resistance plus diode check using standard test leads. The large LCD indicates overload and provides overload protection within a minute. Each model has a built-in thermometer function with standard Type-K thermocouple socket and bead wire temperature probe.

Use Model 38091C for temperatures of -40 to 750° C and the 38091F for -40 to 1400° F. Includes test lead set, thermocouple bead wire, 9-V battery with low-battery indicator, instruction manual and carrying case. Each 14-ounce model is 9.1" x 2.8" x 1.4". One-year warranty.

38091C Centigrade Meter

160X140...1-4, \$169.00 ea.; 5-up, \$161.00 ea.

38091F Fahrenheit Meter

160X141...1-4, \$169.00 ea.; 5-up, \$161.00 ea.

Model 380913

2000-Amp DC/AC Clamp Meter

- Measures 0.1-2000 amps dc or ac
- Clamp opens to 2 inches (55 mm) wide for large conductors
- Peak Hold and Data Hold functions
- Hall Effect sensor measures dc current

This Extech clamp-on multimeter is a precision measurement tool that provides excellent operation. Although it is a complex and delicate instrument, its rugged heavy-duty design will allow many years of use. The clamp opens wide to accommodate large conductors up to 1.97 inches (50 mm) in diameter.

Use this precise meter to measure ac amps, dc amps, ac volts, dc volts, ohms and diodes. It measures to 2000 amps maximum with a wide measuring range. You can measure dc current using Hall Effect sensors and ac/dc amps on the inductive conductor. The ac amp/ac volt frequency range is 40-400 Hz. You get 1.5% accuracy in current ranges.

380913 Specifications

Measurement	Ranges	Measurement Range
Current ac/dc	2	200-2000 A
Voltage dc	1	200 V
Voltage ac	1	750 V
Resistance		2 kΩ
Diode Check		Short/non conductance, good/defect test

A large, easy-to-read 1999-count LCD allows clear readout. Model 380913 includes built-in Peak Hold with increased accuracy over a wide range for capturing current surges plus voltage and resistance functions. It also features a zero adjustment knob and built-in Data Hold for all functions. An LSI circuit provides high reliability and durability. It includes built-in over input circuit and low-battery indicator.

Includes test leads, 9-volt battery, carrying case and operation manual. The compact housing measures 9.9" x 2.8" x 1.3" and weighs 1.43 pounds with battery. One-year warranty.

Model 380913

160X135...1-5, \$169.00 ea.; 6-up, \$161.00 ea.

Model 382040

ACA Clamp Multimeter

- Clamp-on measurements to 800 amps
- 1.8-inch jaw opening
- Measures ac amps, ac volts and resistance
- Data Hold function
- Audible continuity check

Model 382040 Digital Clamp Meter is a low-cost, high-reliability test instrument. It is an ideal handheld tester for maintenance and inspection work on all types of electrical equipment. This meter provides the best value for ac current, volts and ohms. Clamp jaws open both sides simultaneously to accommodate a conductor of 42 mm maximum diameter.

382040 Specifications

Measurement	Ranges	Measurement Range
Current ac	2	200-800 A
Voltage ac	1	750 V
Resistance	1	2000 Ω
Continuity		Built-in buzzer
Maximum Common Mode Voltage		500 V dc/peak ac

Features include ac amp measurement to 800 amps without shutting down service. This clamp meter measures the average value of an ac signal and displays it as an equivalent rms value for a sine wave. It also measures ac volts up to 750 volts and resistance up to 2 kΩ. The audible continuity check detects a short or an open circuit. A built-in buzzer sounds if conductance is less than 100 Ω.

The 3.5-digit LCD features .5-inch tall digits. Data Hold freezes measurement for 10 seconds. Includes decimal annunciators and overload protection. Maximum common mode voltage is 500 V dc-peak ac. The sampling time is .4 seconds. A low battery indication appears on the display in the last 20% of battery life.

Comes complete with test probe pair, wrist strap, 250-hour 9-volt alkaline battery and operation manual. The 12-ounce unit measures 8.7" x 3.2" x 1.1". One-year warranty.

Model 382040

160X214...1-5, \$69.00 ea.; 6-up, \$65.50 ea.





Model 30 Basic Digital AC Clamp Meter

- Rugged Fluke reliability
- Measures to 400 A ac, 600 V ac, 200 Ω
- Meets certification and safety standards
- High resolution and accuracy

General-purpose Model 30 Clamp Meter measures up to tough professional standards at a basic price. Single-handedly measure ac current, ac volts, ohms and continuity plus see the results on an easy-to-read digital display. The 30 features high resolution and overload protection in Fluke's tradition of reliability. With all these capabilities in a self-contained package, it's the only troubleshooting tool needed for most jobs.

Fluke 30 Specifications

Measurement	Range/Description
Current ac	200, 400 A
Voltage ac	200, 600 V
Ohms	200 Ω
Continuity	Beeper under 25 Ω
Accuracy	1.3% of reading

Manual ranging is easy with a large six-position switch. Display Hold keeps the last reading on the display. The clamp's jaw will accept one 750 MCM cable or two 350 MCM cables. Overload protection includes 600 A continuous for ac current, 660 V rms for ac volts and 660 V rms continuous for Ohms. Measure humidity up to 85° F (30° C), 95% RH; up to 104° F (40° C), 75% RH; and up to 122° F (50° C), 45% RH.

The Fluke 30 is rugged enough to withstand a drop from a 6-foot ladder and still deliver reliable measurement day in and day out. It meets UL 1244, CSA C22.2 #231, TÜV 0411 certification standards and IEC 1010 safety standard (approval pending).

Powered by a 9-volt battery, Fluke 30 features an automatic low-battery indicator. It comes complete with rugged Hard Point™ TL75 test leads, soft carrying case and user's manual. The 2-pound unit is 1.8" x 3.8" x 8.4". One-year warranty.

Model 30 Clamp Meter
044X127 ...1-5, \$109.00 ea.; 6-up, \$102.50 ea.



Model 32 True-RMS Clamp Meter

- True-rms version
- 200/400-A ranges with a crest factor of 3
- Measures 600 A with a crest factor of 2
- High resolution and accuracy
- Meets certification and safety standards

If you're troubleshooting electrical systems that support non-linear loads such as PCs and adjustable speed drives, you're probably dealing with harmonics. The Fluke 32 true-rms clamp meter delivers the accuracy needed to get the true value of heat-producing current loads at a truly affordable price. You get the true reading of the problem and a good value as well.

Fluke 32 Specifications

Measurement	Range/Description
Current ac	200, 400 A
Voltage ac	200, 600 V
Ohms	200 Ω
Continuity	Beeper under 25 Ω
Accuracy	1.3% of reading
Crest Factor	3 (400 A), 2 (600 A)

Model 32 measures the true current draw from personal computers, adjustable speed drives and office machines which produce harmonic currents. It provides clamp-on simplicity for one-handed operation. Use the six-position switch for manual ranging. Measure true-rms ac current as well as ac volts, ohms and continuity.

No matter how hard you use it, the Fluke 32 will come through like a champ. It's built to take a 6-foot drop and still deliver accurate, reliable measurements inside and out. It's also the only clamp meter in its class that meets UL, CSA and TÜV certification standards (approval pending) and that conforms to IEC 1010-1 safety standards. When you need a hard-working true-rms meter, you can count on Model 32 to deliver rugged reliable value.

Includes Hard Point™ TL75 test leads, soft carrying case and user's manual. The 2-pound unit is 1.8" x 3.8" x 8.4". One-year warranty.

Model 32 Clamp Meter
044X129 ...1-5, \$149.00 ea.; 6-up, \$141.50 ea.



Model 33 Current Master True-RMS Clamp Meter

- Measure current to 700 A ac
- Measure frequency to 10 kHz
- 10,000-count digital display

The Fluke 33 is an industrial clamp built in the Fluke tradition. It is the professional choice for harmonics troubleshooting and general-current measurement. Reliable true-rms capability measures currents accurately with or without harmonics up to 700 A ac and frequency to 10 kHz. This heavy-duty meter quickly evaluates electrical problems associated with traditional and non-linear loads. Track down trouble spots before they become major problems.

Fluke 33 Specifications

Measurement	Ranges	Measurement Range
RMS Current ac	3	0.3-400 A, 700 A, 1 kV
Frequency	1	0.5 Hz-10 kHz
Instantaneous Peak	2	0.4-600 A, 1 kA

Model 33 has simple push-button controls for one-handed operation. Rugged, angular jaws safely pry into tight spaces. Safety-designed handguard clearly defines safe handling zone. Troubleshooting features include manual and auto-range, display mode, sleep mode and power-up self test. Allows in-depth current testing and recording of data for up to 24 hours. Crest provides instantaneous peak current readings. Smooth™ displays three-second running average of rms current or frequency.

MIN/MAX/AVG records levels of frequency or rms current. A 10,000-count digital display updates two times per second. The 40-segment bar graph analog display updates eight times per second. Frequency (Hz) detects the presence of harmonics in neutral currents and determines if they result from unbalanced phases or non-linear loads.

Fluke 33 includes current clamp, clip-on padded holster, 9-V battery, operator's manual and guide. The 1-pound unit is 9.11" x 3.82" x 1.73". One-year warranty.

Model 33 Current Master
044X130 ...1-5, \$269.00 ea.; 6-up, \$255.00 ea.



260 Series Version 8 High-Performance Analog VOMs

Simpson 260 Series 8 Analog Volt-Ohm-Milliammeters are recognized worldwide for their useful capabilities and features. These workhorse meters outperform even the best general-purpose digital multimeters. They are rugged, accurate, compact, easy to use and equipped with mirrored scales to eliminate parallax. Each meter makes accurate measurements of ac and dc voltage, current, resistance, decibels and output voltage. The output voltage function is used for measuring the ac component of a mixture of ac and dc voltage (occurring mainly in amplifier circuits).

Ranges include dc V (0-2.5, 10, 25, 50, 250, 500, 1000 V), ac V (0-2.5, 10, 35, 50, 250 V), dc μ A (0-50 μ A), dc mA (0-1, 10, 100, 500 mV), dc A (0-10 A), resistance (0-2 k Ω , 0-2 M Ω , 0-20 M Ω) and dB (-20 to +10, -8 to +22, 0 to 30, 6 to 36, 20 to 50 dB).

All features come with standard 260-8; 260-8RT includes a protective roll-top case. The 260-8P has exclusive overload relay circuit protection plus audible continuity check; 260-8PRT adds a roll-top case. Each includes batteries, test leads, manual and 90-day warranty. The 3-pound Model 260-8 is 5.5" x 7" x 3.4".

080X280	Model 260-8 VOM.....	1-5,	\$187.00 ea.;	6-up,	\$178.00 ea.
080X284	Model 260-8RT VOM.....	1-5,	225.00 ea.;	6-up,	214.00 ea.
080X282	Model 260-8P VOM.....	1-5,	250.00 ea.;	6-up,	238.00 ea.
080X286	Model 260-8PRT VOM.....	1-5,	286.00 ea.;	6-up,	272.00 ea.
080X050	00805 Simulated Leather Carrying Case.....		70.00 ea.		
080X045	00758 F/C Insulated Temperature Probe.....		236.00 ea.		
080X010	00043 Deluxe Replacement Test Lead Set.....		16.00 ea.		

Models 310 and 310C

Hand-Sized Field Service VOMs

Triplett 310 Series VOMs are hand-sized meters with the versatility and performance of larger, more expensive bench-type instruments. They offer 18 measurement ranges (five dc and ac voltage, four dc current, four resistance), overload protection (diode for meter movement, fuse for RX1 range) and high accuracy (+3% dc, +4% ac). Rugged, self-shielded, high torque barring magnet meter movement provides dependability anywhere, even in strong magnetic fields. Versatility and readability



Series 8 Features

- Large, analog display allows immediate, easy nulling, peaking
- $\pm 2\%$ basic dc voltage accuracy ($\pm 3\%$ ac accuracy)
- Quick, positive "yes/no" checks for voltage, current, continuity
- Reliable, very rapid resistance checks (semiconductor junctions)
- High-current, low-resistance range pinpoints marginal bad contacts
- Wide, dynamic, continuous resistance ranges not limited to # of digits
- Built-in wide range (-20 to +50 dB measurement facilities)
- Superior ac frequency response to 100 kHz
- High immunity to voltage transients and RF interference
- Needs no external power, avoids common mode problems
- Passive voltage, current, dB independent of any other power source
- Simple design for lowest maintenance cost and highest reliability

260-8Xi High-Visibility Analog Meter

Model 260-8Xi is an improvement on Simpson's original 260 Series. Redesigned as a high-impact meter, it withstands the abuse of field operations. The high-visibility yellow color makes this meter ideal for use in hazardous or dark areas where a black instrument might not be easily noticed. Simpson has added a 50-volt measurement on both dc and ac ranges, audible continuity and expanded current range (to a full 10 A).

The 260-8Xi includes all the features of the standard 260-8Xi with the addition of Simpson's exclusive overload relay circuit protection that's resettable for optimal safety and convenience. Each UL 1244 listed meter includes batteries, test leads and manual. Optional yellow or black "Grab-N-Go" deluxe carrying cases allow meter to be used in the case and test leads to be left attached while zipped.

080X380	260-8Xi VOM.....	1-5,	\$202.00 ea.;	6-up,	\$192.00 ea.
080X382	260-8XiPi VOM.....	1-5,	265.00 ea.;	6-up,	252.00 ea.
080X075	00832 Yellow Case.....		52.00 ea.		
080X080	00834 Black Case.....		52.00 ea.		
080X100	150-2 AC Current Clamp.....		94.00 ea.		



260-8Xi Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	3	250 mV-1000 V
Voltage (ac)	1	2.5 V-1000 V
Ohms	3	0 Ω -200 M Ω , 0 Ω -20 M Ω
dc Current	3	50 μ A-10 A
ac Current*	1	0-250 ac A

*Optional ac clamp accessory must be used to measure ac current

TRIPLETT

are not sacrificed for true portability. Each range can be easily viewed on only two clearly defined scale arcs.

Standard 310 includes the following ranges: ac and dc voltage (3 V, 12 V, 60 V, 300 V, 1200 V), dc current (.6 mA, 6 mA, 60 mA, 600 mA) and resistance (20 k Ω , 200 k Ω , 2 M Ω , 20 M Ω) with 20,000 Ω per volt dc sensitivity (5000 Ω /V ac). Model 310C offers ranges of: ac and dc voltage (3 V, 12 V, 60 V, 300 V, 600 V), dc current (.6 mA, 6 mA, 60 mA, 600 mA) and resistance (20 k Ω , 200 k Ω , 2 M Ω , 20 M Ω) with 20,000 Ω per volt dc sensitivity (15,000 Ω /V ac).

Each model includes batteries, test leads and user's guide. These 14-ounce meters are 2.75" x .9" x 4.25".

090X310	Model 310 VOM.....	1-5,	\$82.00 ea.;	6-up,	\$76.00 ea.
090X311	Model 310-C VOM.....	1-5,	112.00 ea.;	6-up,	104.00 ea.
090X369	369 Std. Vinyl Carrying Case.....		11.50 ea.		
090X370	10-1791 Deluxe Leather Carrying Case.....		24.00 ea.		
090X953	79-153 Std. Replacement Test Leads.....		9.00 ea.		



Model ACDC-1000

Digital AC and DC Current Clamp

Our most popular digital clamp-on current clamp, the ACDC-1000, features a large, easy-to-read LCD display, accuracy to $\pm 1\%$ and circuit protection to 400 V. It can withstand momentary overloads up to 50%. Autoranging with ohmmeter and surge-measuring capability. Features include electronic pointer lock which freezes readings so they can be read away from conductor and extendo-type leads with replaceable probe tips.

Measurements include: **ac and dc voltage** (0-199.9/999 [C], 0-999 [P]); **ac and dc current** (0-199.9/999 [C], 1-999 [P]); **resistance** (0-199.9/1999 Ω). The ability to read ac/dc V and A up to 999 in peak mode is especially useful for capturing motor starting currents and other surges.

The ACDC-1000 is 9.13" x 3.75" x .56" overall, has a jaw opening of a full 2" and weighs 15 ounces. Comes complete with carrying case, all-weather extendo test leads, alligator test clip adapter, ohmmeter test lead and user's manual. Requires 9-V alkaline battery (not included).

[C] refers to continuous mode; [P] refers to peak mode

008X007 ACDC-1000 Current Clamp...1-5, \$395.00 ea.; 6-up, \$372.00 ea.



Model RS-3A

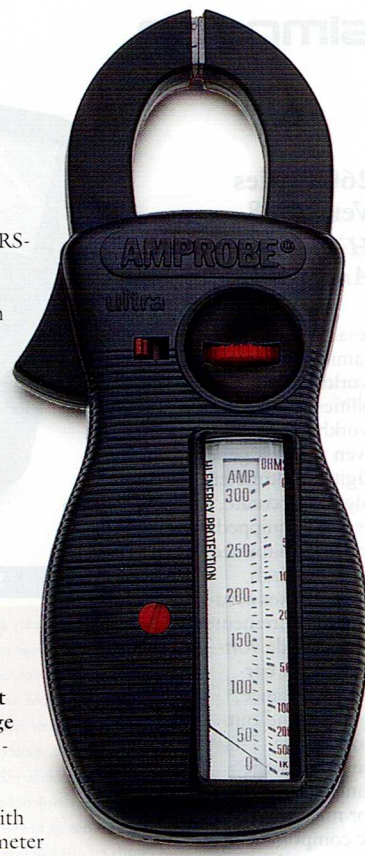
Rotary Scale Clamp-On Instrument

The industry standard Amprobe RS-3A Amp-Clamp is the most popular instrument of its kind in use today. Literally tens of thousands have been sold. It is an average sensing instrument calibrated to read out in rms. **Extend leads** act as an extra pair of hands, making voltage measurements faster and easier. **Clamp-on transformer jaws** can clamp around conductors up to 1" (2.54 cm) in diameter or 500 MCM to take current readings without interrupting service. **Pointer Lock** locks the pointer so it can be read where convenient. **Recessed break-resistant window** magnifies scale for easy reading. **Lock-in leads** prevent exposed high voltage.

Specifications include: **ac current** (0-6, 15, 40, 100, 300 A); **ac voltage** (0-150, 300, 600 V); **resistance** (25- Ω midscale ohmmeter). Accuracy is $\pm 3\%$ of full scale.

This 10-ounce unit is supplied with all-weather extendo test leads, ohmmeter battery adaptor and case. Uses one AAA battery (not included).

008X020 RS-3A.....1-5, \$93.00 ea.; 6-up, \$89.00 ea.



Models RS-7A/PRS-7R

Current and Voltage Recorder Combination

Amprobe has a whole new idea in measuring and recording instrumentation. Similar to the industry-standard RS-3A rotary scale clamp-on, RS-7A measures amps, volts and ohms. It has all the famous features of Amprobe RS instruments plus a recorder output jack for connection to companion recording module PRS-7R. This module adds strip chart recording capabilities to typical amp-clamp measurements. It makes unattended testing and hard copy voltage and current output possible for the first time at this price.

RS-7A specifications include **ac current** (0-5, 25, 50, 100, 250 A); **ac voltage** (1-150, 300, 600 V); **resistance** (25- Ω midscale ohmmeter). It clamps around up to 1" conductors. When used with PRS-7R, RS-7A has an accuracy of $\pm 4\%$ of full scale.

The RS-7A includes all-weather extendo test leads, ohmmeter battery adaptor and carrying case. The PRS-7R comes in a deluxe (integral) case with 6' output cord. It uses 850A chart paper for current and 830AV600 chart paper for voltage output. *All items must be purchased individually.*

008X030 RS-7A1-5, \$120.00 ea.; 6-up, \$114.00 ea.

008X012 PRS-7R-12.....1-5, 207.00 ea.; 6-up, 195.00 ea.

008X900 830AV600 AC Voltage Paper (box of 6).....36.00 box

008X905 850A AC Current Paper (box of 6)36.00 box



1000-Amp Mini AC/DC Clamp Meter

With Wide AC/DC Current Measuring Ranges

This compact, rugged clamp-on meter features wide ac/dc measuring widths. Jaws open to 1.2 inches (30 mm) wide to measure voltage, current and resistance. Model 380915 provides simple operation. It features a .5-inch, 3.5-digit LCD with data hold and automatic polarity. It also has an overload protection circuit with indication. This high-quality meter meets IEC 348 safety requirement. A test socket fuse is provided for safety.

Model 380915 Clamp Meter comes with test leads, 9-volt battery and case. This .5-pound meter is 7.1" x 1.9" x 1.4". One-year warranty.

160X137 380915 Meter.....1-5, \$159.00 ea.; 6-up, \$147.00 ea.



380915 Specifications

Measurement	Ranges	Measurement Range
Voltage (dc)	1	200 V
Voltage (ac)	1	500 V
Current (dc/ac)	2	200 A, 1000 A
Resistance (Ω)	1	200 Ω
Frequency (ac A/ac V)		40-400Hz

NEXT-DAY DELIVERY
ONLY \$14.95!





Model 36 Clamp Meter

AC/DC and True-rms Measurements

- AC/DC current
- AC/DC voltage
- Resistance
- Continuity beeper
- Max hold

Now you can do more with one tool. The Fluke Model 36 is a rugged reliable clamp meter that measures ac and dc current and volts. This versatile clamp meter offers true-rms sensing and Max Hold for measuring in rush current or maximum load on a circuit. The tapered jaws and slim profile let you get at cables in tight places. Use Model 36 for troubleshooting in industrial, commercial, avionics and marine environments.

Fluke 36 Specifications	
Measurement	Range
Current ac	600 A, 200 A
Current dc	1000 A, 200 A
Volts ac	600 V, 200 V
Volts dc	200 V, 600 V
Ohms	200 Ω
Continuity	Beeper under 600 V rms
Accuracy	2%
Crest Factor	3

Jaws accept one 750 MCM (1.2", 3 mm) cable or two 500 MCM (.98", 2.46 cm) cables up to 38 mm (1.5" in diameter). Use the dc current zero control for nulling out jaw/sensor offset. Other features include easy single-handed operation, easy-view 2000-count digital display, continuity beeper and overload protection. Powered by an alkaline battery with 60-hour continuous life. Sleep mode extends battery life. Safety symbols include UL, CSA, CE and CAT III-600V.

Includes TL 75 test leads, safety hand guard and protective soft carrying case. The 1-pound meter measures 9.8" x 3.75" x 1.75". One-year warranty.

045X000 Model 36 Clamp Meter.....1-5, \$219.00 ea.; 6-up, \$208.00 ea.

Model GP-1 Ground Probe™

Earth Ground Resistance Tester

- Measures earth ground resistance (Ω)
- Automatically calculates resistivity (Ω m)
- RS-232 download
- 100 memory locations

Model GP-1 is a rugged, battery-operated earth ground resistance tester that automatically calculates resistivity and can download to a PC. Use 100 memory locations to store two-point, three-point (fall of potential) and four-point resistance/resistivity test results. This auto ranging, water-resistant ground probe has a 3.5-digit LCD that is .75" high.

The GP-1 is a complete kit for testing existing earth ground electrodes to equipment manufacturer specifications or as mandated by national code requirements of proper grounding, typically 25 Ω or less. It also tests soil resistivity for new ground system designs. Other testing applications include cathodic protection, soil contamination, lightning protection and isolated grounding. The GP-1 also functions as a voltmeter up to 600 V ac.



GP-1 Specifications

Resistance		Resistivity	
Range	Resolution	Range	Resolution
0-19.99 Ω	.01	0-19.99 Ω m	.01
20-199.9 Ω	.1	20-199.9 Ω m	.1
200-1999 Ω	1	200-1999 Ω m	1
Accuracy:	$\pm 2\%$ of reading + 2 digits	2 k-19.9 k Ω m	10
		20 k-199.9 k Ω m	100
		200 k-314 k Ω m	1000
Voltage			
Range:	0-600 V rms max $\pm 2\%$ of reading + 2 digits	Accuracy:	$\pm 2\%$ of reading
		Test Current:	<10 ma rms sine wave
Frequency Response:	60 Hz $\pm 1\%$	Test Frequency:	135 Hz $\pm 2\%$ of reading + 2 digits

Comes complete with GP-CS (30' 10-m green test cable, 30' black test cable, 47' red test cable and 77' blue test cable), GP-MR (four 9" measuring rods), GP-TL (safety banana test lead set), GP-RS232 (9-pin male to 9-pin female RS-232 cable), download software and black shoulder pouch. The 7.25-pound GP-1 measures 13.6" x 5.1" x 9.8". Four D cells (not supplied) are required for operation. One-year warranty.

008X970 GP-1 Ground Probe.....1-2, \$1880.00 ea.; 3-up, \$1772.00 ea.



Digital Sound Level Meter Highly Accurate Large Display

- Three input signal ranges
- Meets IEC 651 Type 2 standards

Read both A and C frequency weightings on this high-accuracy, rugged, hand-held unit that meets IEC 651 Type 2 standards. The wide 30- to 130-dB measurement span is divided into three ranges (30-80, 80-100, 80-30 dB) to ensure greater accuracy. Includes 50 dB on each step with over/under range indication. The display is easy to read on the large .7-inch, 3.5-digit LCD.

Specifications include: resolution of 0.1 dB; accuracy of $23 \pm 5^\circ \text{C}$, 1.6% at 94 dB (1 kHz); operating temperature of $0-50^\circ \text{C}$ ($32-122^\circ \text{F}$); and maximum operating humidity of 90% RH ($0-35^\circ \text{C}$).

The user can select a response time of either fast (200 ms) or slow (500 ms) depending on the application. A MAX HOLD function can store the maximum value of the display. The meter's electric condenser microphone ensures high accuracy. Both ac and dc outputs are standard through a phone output terminal for connection to an analyzer or recorder.

Model 407740 comes with a 9-volt battery and carrying case. This 10-ounce unit is 8.1" x 3.2" x 1.4". One-year warranty.

160X387 407740 Sound Level Meter1-4, \$199.00 ea.; 5-up, \$183.00 ea.



Combination Contact/Photo Tachometer Makes Precise Non-Contact Measurements

- Contact tachometer measures from -5 to 20 k rpms
- Photo tachometer measures from -5 to 100 k rpms

Model 461895 combines both photo and contact tachometers in one compact digital instrument. Characters on the large five-digit display will reverse direction depending on the measurement mode. This tachometer uses an exclusive one-chip microcomputer LSI circuit and crystal time base that quickly offers high-accuracy measurements to 0.05%. Microprocessor precision permits readings to a resolution of 0.1 rpms in photo or contact mode. The last max/min value is automatically stored in memory and can be displayed by pressing the Memory Call Button.

As a contact tachometer, it measures from -5 to 20 k rpms. The photo tach function can measure from -5 to 100 k rpms. Linear surface speed measurements are taken either from -0.05 to 20 km/minute or -0.2 to 6560 feet/minute.

The 461895 Contact/Photo Tachometer comes complete with cone, rpm sensor tip, surface speed wheel, four 1.5-V AA batteries, reflective tape, carrying case and instructions. Weighing less than 1 pound, it measures 8.5" x 2.6" x 1.5". One-year warranty.

160X695 461895 Tachometer.....1-4, \$229.00 ea.; 5-up, \$219.00 ea.



Digital StrobeTach Freezes Motion and Measures Speed without Contact

- Measures from 100 to 10 k rpms
- Strobe flashes from 100 to 10 k fpms

Model 461830 is a light-duty stroboscope tachometer. It checks and analyzes motion and speed simply by aiming and synchronizing its flash rate (fpm) with a rotating object. Read rpms on a 0.3-inch, four-digit LED display. Duty cycles range from 5 to 30 minutes depending on rpm range. Required sampling time is 1 second. Its exclusive one microcomputer chip LSI circuit and crystal control time base provide high accuracy $\pm 0.05\%$ over a wide, dynamic range.

This instrument is ideal for measuring the speed of moving gears, fans, centrifuges, pumps, motors and other equipment used in general industrial maintenance, production, quality control and laboratories. Simple to operate, plug the unit into a 110-V ac power source and turn it on. Select from two test ranges. Low range measures 100 to 1k flashes per minute (fpms) or rpms. High range measures from 1 k to 10 k fpms/rpms. Adjust the strobe rate until flashing is in unison (one to one) with the object being monitored.

The Digital StrobeTach comes complete with handle, 6-foot ac power cord and instructions. It can be mounted on a standard tripod. This 2.2-pound unit measures 8.3" x 4.8" x 4.8". One-year warranty.

160X670 461830 StrobeTach1-4, \$229.00 ea.; 5-up, \$199.00 ea.



Model 815 Handheld Parts Tester

B&K's Handheld Parts Tester with digital readout is designed for field service or general industrial applications. It does more and costs less than most capacitance-only meters. Model 815 tests capacitance, resistance, transistors, SCRs, diodes, LEDs, batteries and more. It has 26 ranges in all and features an oversized 0.8-inch high, 3.5-digit LCD. The 815 can withstand a 5-foot drop and is overload protected (fused).

Designed to seal out rain, grease, dirt and other environmental contaminants that could affect performance. Includes test leads, spare fuse, battery and manual. The 12-ounce unit is 6.9" x 3.3" x 1.3". One year-warranty.

110X525 815 Parts Tester.....1-5, \$99.00 ea.; 6-up, \$94.50 ea.



Model 815 Specifications

Measurement	Ranges	Measurement Range
Capacitance	9	200 pF-200 mF
Resistance	6	200 Ω -20 M Ω
Transistor Test	4	0-1000 hFE (PNP & NPN) 10 nA-20.00 mA (Icco)
Diode Test	1	1 mA (forward junction V)
LED Test	2	10 mA, 2 mA
Battery Test	3	9 V, 1.5 V (AA, C or D), 1.55 V (Button Cell Load)



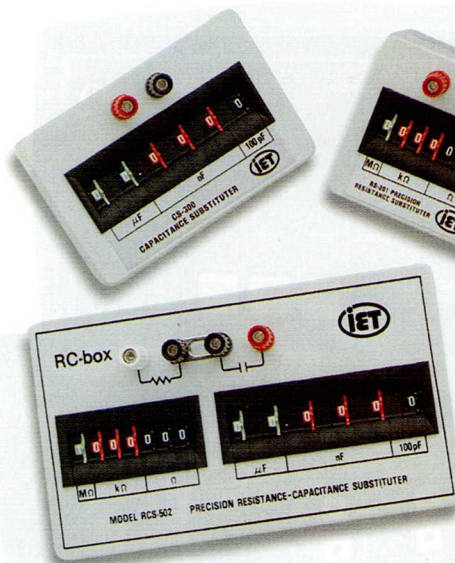
Substitution Boxes

Resistance/Capacitance/Inductance

IET Labs presents a full line of standard substituters to satisfy virtually any customer requirement. Simply dial in the desired value by setting the easy-to-read, side-by-side thumb-wheel switches. They are even color-coded to separate the various resistance and capacitance ranges! Since the impedance values are set and read directly, it's virtually impossible to make a mistake (unlike traditional decade boxes with confusing rotary and slide switches).

These precision substituters are accurate to 0.1% (depending on model) and can accommodate the Resistance Range of 0.1 Ω -99.999999 M Ω , Capacitance Range of 1 pF-99.99999 μ F and Inductance Range of 1 μ H-99.99999 H (both standard and precision models available). We also offer combination units that combine resistance and capacitance into one easy-to-use box. These combination units can be used independently, in series or in parallel. They also include a shorting link that allows them to be used coupled as well as separately. Made of a special high-impact plastic, these units will offer a lifetime of service. Choose from eight models.

417X200	RS-200	1-5, \$146.00 ea.; 6-up, \$139.00 ea.
417X201	RS-201	1-5, 279.00 ea.; 6-up, 265.00 ea.
417X203	RS-201W	1-5, 479.00 ea.; 6-up, 455.00 ea.
417X300	CS-300	1-5, 156.00 ea.; 6-up, 149.00 ea.
417X301	CS-301	1-5, 299.00 ea.; 6-up, 284.00 ea.
417X398	LS-400	1-5, 569.00 ea.; 6-up, 541.00 ea.
417X500	RCS-500	1-5, 289.00 ea.; 6-up, 275.00 ea.
417X502	RCS-502	1-5, 569.00 ea.; 6-up, 541.00 ea.



Model	RS-200	RS-201	RS-201W	CS-300	CS301	LS400	RCS-500	RCS-502
Substituter Type	Resistance	Precision Resistance	Wide Range Precision Resistance	Capacitance	Precision Capacitance	Wide Range Inductance	Resistance/Capacitance	Precision Resistance/Capacitance
Accuracy	1%	0.1%	1%	4%	1%	1.5%	1%	0.1%
Decades	7	7	9	6	6	4	7/6	9/6
Range	0-9,999,999 Ω	0-9,999,999 Ω	0-99,999,999 Ω	0-99.999 μ F	0-99.999 μ F	0-9.999 H	See individual units	



Model 878 Universal LCR Bridge

This dual-display, hand-held LCR bridge sorts component parts in engineering, quality control or production. Model 878 accurately measures dissipation of capacitors and Q of

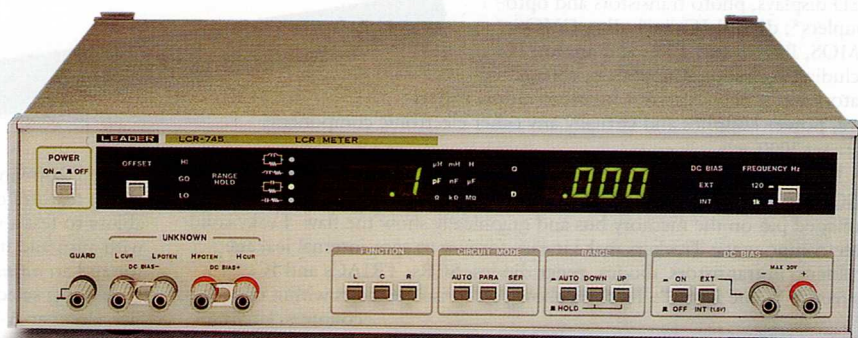
inductors. It simultaneously displays a three-digit, 1-k-count LCD of DF or Q and a four-digit, 10-k-count LCD of inductance, capacitance or resistance measurement values.

Relative mode displays the difference between measured and reference component values. Tolerance mode beeps to indicate a measured component value outside a preset 1%, 5% or 10% tolerance of a reference value. Max-Min/Avg. stores min or max values and keeps a running average of tested values. This auto or manual ranging meter also has Data Hold and two selectable test frequencies (120 Hz and 1 kHz). The 14-ounce unit is 7.6" x 3.5" x 1.5". Includes standard test lead pair, ac adaptor and instruction manual. One-year warranty.

Model 878 Specifications

Measurement	Ranges	Measurement Range
Inductance	8	1 mH-10 kH
Capacitance	8	1 pF-10 mF
Resistance	7	10 Ω -10 M Ω

110X535 878 LCR Meter1-5, \$275.00 ea.; 6-up, \$262.00 ea.



Model LCR-745 Digital LCR Meter

- Measures: Inductance/Capacitance Resistance/Dissipation/Quality
- Basic measurement accuracy of +0.35%
- Test frequencies of 1 kHz and 120 Hz

LEADER

The LCR-745 is a CPU controlled digital LCR Meter with automatic and manual ranging. Direct resistance, capacitance and inductance measurements of components or equivalent series and parallel circuits can be made with Quality (Q) and Dissipation factor (D) displayed simultaneously with inductance and capacitance. The unit's wide automatic measurement range greatly reduces the time associated with performing these component measurements compared with a manual LCR bridge. This makes the LCR-745 an ideal instrument for incoming inspection or final production test of components where ease of operation and high throughput are essential.

An offset function is also featured that can be used to cancel any residual resistance, capacitance or inductance of the test leads or fixtures being used. In addition, the meter's offset function may be used to normalize the value of a component under test to zero. The deviation (including polarity) from this normalized view of succeeding components will be displayed, simplifying testing.

Two test frequencies, 120 Hz and 1 kHz, are standard, facilitating the testing of electrolytic capacitors. In addition, an external dc bias in the range of 0 to +30 V can be applied; an internal bias of +1.5 V is available. This meter provides basic measurement accuracy of +0.35%. The LCR-745 measures 15.25" x 4" x 12", weighs 12 pounds and is supplied with a comprehensive guide to operations.

061X351 Model LCR-745 Meter1-2, \$1725.00 ea.; 3-up, \$1649.00 ea.



Huntron Trackers In-Circuit, Power-Off, Component-Level Testers

When catastrophic failures make ordinary testing impossible, technicians turn to Huntron Trackers. They're extremely effective when troubleshooting electronic systems that can't be turned on because a critical part has failed. Since you don't have to apply power to the system, there's no risk of further damage while troubleshooting. Trackers can tell you far more about a circuit than power-on test instruments — like spotting intermittent component failures! That's because they test the actual P-N structure of a device without system power by showing you an actual picture of the component's health. Quickly determine the condition of a component simply by analyzing the Tracker's display — without documentation or reference devices!

Use Trackers to test any of the following components: **diodes** including general-purpose, Zener, tunnel, varactor and high voltage; **transistors** including NPN and PNP Bipolar, Darlington, JFET, MOSFET and Uni-junction; **thyristors** including SCR*, SGS*, GCS, Triac* and Diac; **optoelectronic devices** including LEDs, LED displays, photo transistors and optocouplers*; **digital ICs** including CMOS, NMOS, PMOS and TTL; and **analog ICs** including operational amplifiers, voltage regulators and timers. Also test **memory chips**, **capacitors**, **power supplies** and virtually any other electronic component!

*Tracker 2000 only.

Huntron Trackers also test for faulty memory. Unlike logic analyzers and DSOs that can tell you only that the logic is bad, Trackers actually isolate the damaged pin on the memory bus and graphically show the flaw. Leaky solid state components: Trackers make it easy for you to spot internal leakage problems in transistors, diodes, zener diodes, SCRs, TRIACs and ICs. Defective "Glue Logic": Trackers allow you to isolate faults within decoders, counters, latches, etc. without sending the board back to the manufacturer.

Noisy capacitors: Huntron Trackers not only find hard-to-locate noise, they actually show you the dielectric breaking down.

TRACKER Specifications

Range	Ranges				
	Vs (Vpk)	Zs (kΩ)	Isc (mA rms)	Pmax (mW)	Pdiode (mW)
High	60	74	0.6	6	.2
Medium 2	20	27	0.6	2	.2
Medium 1*	15	1.2	8.5	23	2
Low	10	54Ω	132	232	33

*Tracker 2000 only

Two Models Available!

Choose from either the original Tracker 1000 designed for low-volume testing on solid-state and passive devices in a variety of configurations (digital, analog or a mixture) or the high-end Tracker 2000. The 1000 has manual range selection and features Huntron's exclusive Compar-A-Trace.



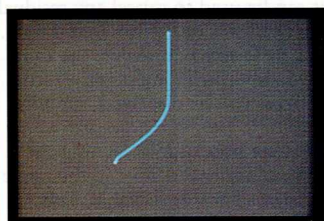
Tracker 2000 includes all the features of the 1000 plus the ability to test a wider range of devices dynamically (four impedance ranges with auto and manual ranging and high-range lockout, built-in pulse generator and an adjustable rate Compar-A-Trace). The 2000 has both manual or auto range selection plus a high-range lockout and features Huntron's exclusive Compar-A-Trace (adjustable rate of 0.5 Hz to 10 Hz).

Tracker 1000 is the original Huntron Tracker. It measures 11" x 9" x 4", weighs about 5 pounds and is powered by line voltage (100 V ac, 115 V ac or 230 V ac). It is shipped complete with one pair of Huntron μ Probes, common test leads, ac power cord and complete operating instructions. One-year warranty. For even more versatility, consider adding the optional Switcher 410 — see next page for complete details!

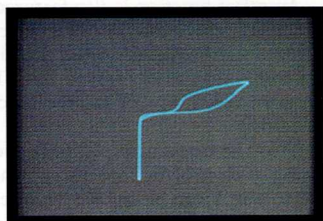
414X200 Tracker 1000\$740.00 ea.

Tracker 2000 measures 11" x 9" x 4", weighs 6.5 pounds and is powered by line voltage (100 V ac, 115 V ac or 230 V ac). It is shipped complete with one pair of Huntron μ Probes, common test leads, two mini-clip leads, ac power cord and complete operating instructions. One-year warranty. For even more versatility, consider adding the optional Switcher 410 or Switcher 640 — see next page for complete details!

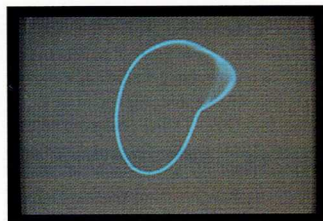
414X100 Tracker 2000\$1885.00 ea.



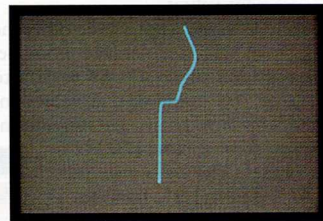
7474N, Pins 5 and 7
Bad Flip-Flop



NPN Power Transistor
Defective Power Transistor



A 100- μ F, 25-V Tantalum Capacitor
Noisy Capacitor



LM 301A, Pins 2 and 7
Defective Op Amp





Switcher 410

Works with Both the Tracker 1000 and 2000

Switcher 410 makes the Tracker even more efficient. Dual inputs route signals from a known good part and the suspect part to the Tracker 1000 or 2000. Attach a DIP clip to the IC being tested and use the Switcher's 40 push-buttons to display the signature of each pin. Test up to 40-pin devices with 20- and 40-pin ZIF sockets and DIP clips with cables. Customize the Switcher 410's cable with special edge card connectors or other interface devices. This is a low-cost solution to the high cost of conventional fixturing.

The 410 is invaluable for troubleshooting semi-custom ICs like PLAs. Components are easy to compare because every pin, except ground and Vcc, shows a similar signature. If the signature of any pin is different, the device is defective. Pin-by-pin comparison is an excellent way to troubleshoot all types of ICs from standard TTL and CMOS to custom hybrids.

Switcher 410 includes two 40-pin DIP clip cables, two 16-pin DIP clip cables, keyboard overlays, two reference wires, power/clock cable and manual. The 2.5-pound unit is 7.5" x 10" x 2". One-year warranty.

414X325 HSR-410.....\$785.00 ea.

Shortrack®

Works with Huntron Trackers to Identify PCB Shorts Quickly

A shorted capacitor, solder splash or bad trace can make troubleshooting a board very difficult. Working with the Tracker 1000 or 2000, Shortrack® quickly and cost effectively isolates these problems. It's a shortcut for finding short circuits and shorted capacitors. The Shortrack-90 has a frequency response of 50-2000 Hz and displays 101 segments (updated 25/second) in Analog Mode with 999 counts (updated 2.5/second) in Digital Mode. The .5-pound unit measures 5.5" x 3.25" x 1.5" and is powered by a 9-volt battery. One-year warranty.

414X700 Shortrack-90.....\$395.00 ea.



HUNTRON

DSI-700

Digital Storage Interface Works with Tracker 2000

The DSI-700 adds digital storage capabilities to the Tracker 2000 at a significant savings. This portable diagnostic tool can interface with any IBM-compatible portable computer. It scans electronic components to determine analog signatures and then digitizes and stores them on disk. Storage capability eliminates the need to take along an inventory of known-good boards for field site comparison and speeds up electronic troubleshooting.

Based on Huntron Tracker 5100DS software, the DSI-700 has a six-item main menu. It includes Edit, Learn, Test and Report modes plus Back-up and Restore. The DSI-700 makes electronic troubleshooting more efficient by automating a portion of the signature comparison process. Less experienced technicians have the benefit of a signature database without having to memorize or stop and manually refer to a known-good signature. The DSI-700 may be operated with a Tracker 2000 and an IBM-compatible PC in remote mode or with the Tracker only in local mode.

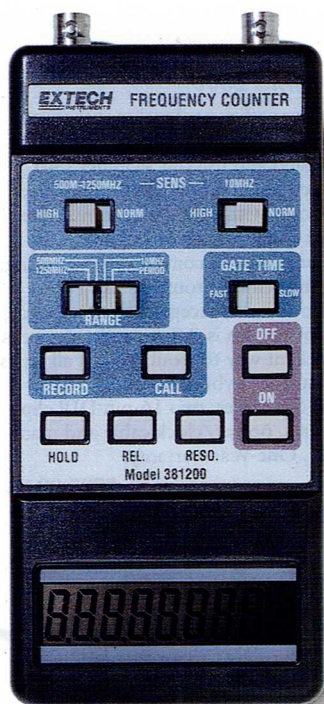
This interface connects to a PC with a VGA/EGA monitor through the parallel port. It scans electronic components to determine their analog signatures. Then it digitizes signatures up to 128 pins at a time and stores them on disk. The suspect board component is compared to known-good signatures stored in the database. No programming is necessary. The computer display prompts to assist in setting the Tracker's buttons, and it identifies any pin signatures outside the user-selected tolerance range.

When the DSI-700 is used in local mode, a PC is not needed. Simply connect test leads to the same component on both known-good and suspect boards. Then the DSI-700 automatically searches for differences in signatures. The Tracker displays signatures for quick comparison and accurate diagnosis of where the problems lies.

This power-off troubleshooting device includes two 40-pin DIP clip cables, two 20-pin DIP clip cables, two each 8-, 16-, 20-, 24-, 28- and 40-pin DIP clips, power/clock cable and instruction manual. The 4-pound DSI-700 is 9" (W) x 4" (H) x 11" (D). One-year parts and labor warranty.

414X750 DSI-700 Digital Storage Interface.....\$3495.00 ea.





EXTECH
INSTRUMENTS

Handheld Frequency Counter

Microprocessor Measures up to 1.25 GHz

The 381200 handheld micro processor counter has a wide measuring width ranging from 10 Hz to 1.25 GHz. It provides high sensitivity in low/high ranges with a resolution of 0.1 Hz. Period display values range from 10 Hz to 10 MHz.

Model 381200 provides max, min and average readings. It features data hold and provides relative frequency measurements. The easy-to-read, eight-digit LCD display is .5 inches high. A low ppm crystal time base provides optimal

accuracy. Set the gate time selector to fast or slow. The 381200 features overload indication plus auto/manual power off. This compact device has a built-in stand. It is battery or ac operated.

The Extech Handheld Frequency Counter comes complete with four AA 1.5-volt batteries. Weighing 12 ounces, it measures 6.8" x 3.1" x 1.4". One-year warranty.

160X170 381200 Frequency Counter...1-5, \$209.00 ea.; 6-up, \$196.00 ea.



Model LDC-825 1-GHz Frequency Counter

Lab Quality Counter

LEADER

- Frequency range of 10 Hz-1 GHz
- Large eight-digit fluorescent display is easy to read
- High sensitivity of 20 mV-80 MHz and 50 mV-1 GHz

Model LDC-825 provides accurate, reliable frequency and period measurements for a wide variety of laboratory, communications and bench applications. LSI and MSI technology plus a large fluorescent display are incorporated to provide a cost-effective instrument that is well-suited for production testing and other applications requiring a large, bright display. A well-shielded metal case virtually eliminates errors caused by nearby RF fields. This counter has high time base accuracy of ± 0.03 ppm.

The period function can reduce sampling times plus increase measurement accuracy and resolution. Time duration of one period is measured and averaged over the gate time. Period mode is particularly useful when performing high-resolution adjustments because the counter readout permits constant observation for any change in frequency. Six gate times and three multipliers combine with four ranges of period measurements to determine speed of update or resolution of readings.

This 5.5-pound counter is 9" x 3.5" x 11.3". It comes with a 50- Ω BNC-BNC cable and operating instructions. Two-year warranty.

061X275 LDC-825 Counter1-2, \$1495.00 ea.; 3-up, \$1420.00 ea.

WAVETEK



Model FC130A 1.3-GHz Frequency Counter

- Frequency range of .01 Hz-1.3 GHz
- Measures frequency, period and rpm
- Typical sensitivity of 10 mV

Wavetek's FC130A is a microprocessor-controlled frequency counter that also measures period and rate per minute (rpm) over an exceptional 0.01 Hz-1.3 GHz range. This precision instrument is invaluable in R & D, troubleshooting and repairing electronic equipment including radios, telephones and computers. Use it for rotational measurement and calibration checks.

Features include high resolution (as low as 10 mHz for a 1-Hz input) and an eight-digit LED readout with floating point and overflow indication. It has 10-mV input sensitivity (typical), continuously variable gate time selection, switchable ac/dc input coupling, built-in self-diagnostic routine, switchable X20 attenuator and low pass input filter. Model FC130A measures the period of a function from 8 ns to a full 100 seconds in duration. An rpm feature accurately measures from 0.6 rpm to 7200 million rpm.

Model FC130A meets stringent requirements for years of rugged service. It features a cushion grip carrying handle/tilt stand, rear cord wrap and recessed areas on the top cover for stacking multiple units. The 4.5-pound unit is 3" x 9" x 13". Includes power cord, two test cables, spare fuse and operator's manual. One-year warranty.

204X870 FC130A Counter1-5, \$599.00 ea.; 6-up, \$569.00 ea.



Model UC-10A 100-MHz Universal Counter

- Frequency range of 5 Hz-100 MHz
- Two input channels and four selectable gate times
- Measures frequency, period, ratio, interval and count

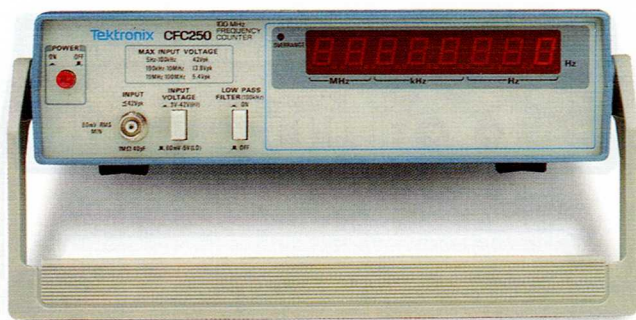
Model UC-10A from Wavetek is a feature-packed, highly accurate 100-MHz universal counter. It measures frequency, period, frequency ratio of input channels, time interval and unit count. Functions handle simple counting to general audio and computer service, cordless telephone repair and function generator calibration. The UC-10A measures frequency from 5 Hz to 100 MHz. Its input sensitivity is 20 mV over the entire range with four user-selectable gate times for measurements at four resolution levels.

Push-buttons access six functions, four gate time selections, attenuator, input frequency range and reset. All function selections are indicated by an LED and an annunciator tone. A large eight-digit display clearly indicates all readouts with LEDs that identify Over, Gate, kHz and μ sec. A built-in 10:1 attenuator prevents false counting on high-amplitude signals. Self-checking capabilities verify internal time base generator and counter accuracy.

The compact, rugged UC-10A features cushion grip carrying handle/tilt stand, rear cord wrap and recessed areas on the cover for stacking multiple units. This 5.5-pound unit is 3" x 9" x 13". Includes two test leads, ac power cord, three fuses and operator's manual. One-year warranty.

204X950 UC-10A Counter1-5, \$389.00 ea.; 6-up, \$369.00 ea.

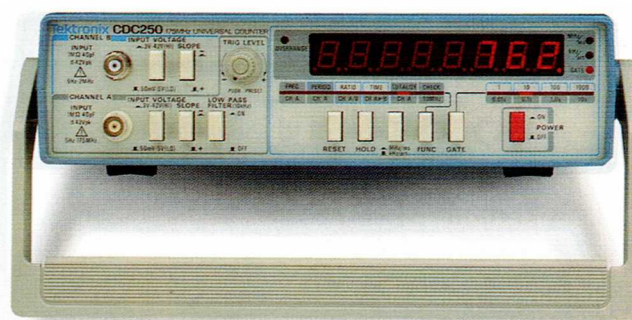




Model CFC250 100-MHz Frequency Counter

Model CFC250 100-MHz Frequency Counter measures sine, square and triangle wave frequency from 5 Hz to 100 MHz at input levels of 5 Hz to 100 MHz at input levels from 30 mV to 42 V peak. Students enjoy its simplicity. Applications include adjustment, testing and repair of electronic items such as audio equipment, radios, televisions, computer clocks and musical instruments. This 5-pound unit is 10.5" x 8" x 3". Includes US power cord and manual. One-year warranty.

220X155 CFC250 Counter1-2, \$399.00 ea.; 3-up, \$383.00 ea.



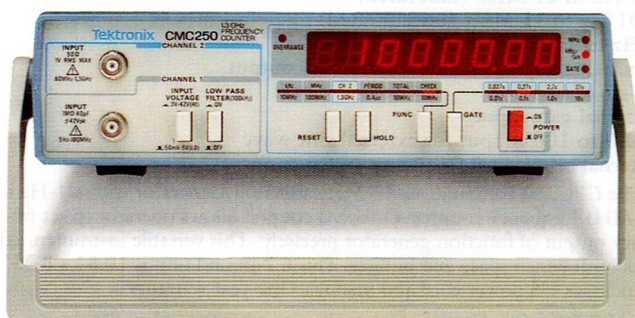
Model CDC250 175-MHz Universal Counter

The CDC250 175-MHz Universal Counter measures sine, square and triangle wave frequency from 1 Hz to 175 MHz at input levels of 20 mV to 42V peak. Provides period measurements, frequency ratio, time interval and totalize measurement functions. Has ± 1 ppm/year, temperature-compensated time base for consistent accuracy. Service technicians find it useful as a standard for calibrating other equipment. This 6-pound unit is 10.5" x 8" x 3". Includes US power cord and manual. One-year warranty.

220X151 CDC250 Counter1-2,\$545.00 ea. 3-up, \$523.00 ea.

Tektronix Multifunction Counter Comparison Chart

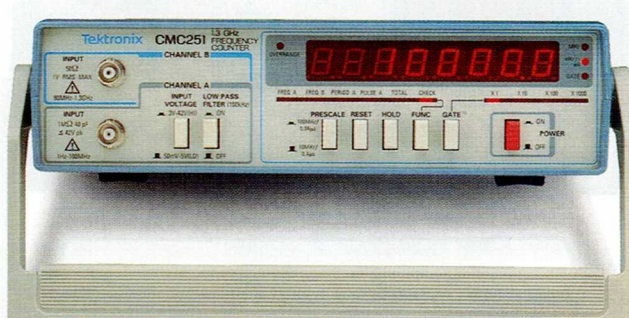
	CFC250	CDC250	CMC250	CMC251
Channel A	Frequency Range: 5 Hz to 100 MHz Max Input Voltage: 5 Hz to 100 kHz: 42 Vpk; 100 kHz to 10 MHz: 13.8 V pk; 10 MHz to 100 MHz: 5.4 V pk	Frequency Range: 1 Hz to 175 MHz Max Input Voltage: 1 Hz to 5 MHz: 42 V pk; 5 MHz to 175 MHz: 4.9 V pk Frequency Range: 1 Hz to 2 MHz	Frequency Range: 1 Hz to 100 MHz Max Input Voltage: 5 Hz to 5 MHz: 42 V pk; 5 MHz to 100 MHz: 4.9 V pk Impedance: 1.0 M Ω , paralleled by 40 pF Frequency Range: 80 MHz to 1.3 GHz	Frequency Range: 1 Hz to 100 MHz Max Input Voltage: 1 Hz to 5 MHz: 42 V pk; 5 MHz to 100 MHz: 4.9 V pk Impedance: 1.0 M Ω , paralleled by 40 pF Frequency Range: 80 MHz to 1.3 GHz
Channel B		Frequency Range: 1 Hz to 2 MHz Impedance: 1.0 Ω , paralleled by 40 pF Max Input Voltage: 42 V pk	Frequency Range: 80 MHz to 1.3 GHz Impedance: 50 Ω Max Input Voltage: 1 V rms	Frequency Range: 80 MHz to 1.3 GHz Impedance: 50 Ω Max Input Voltage: 1 V rms
Period		Range: 0.5 μ s to 0.2 s Resolution: 100 ps to 100 ns Frequency Range: 1 Hz to 2 MHz	Range: 0.4 μ s to 0.2 s Resolution: 100 ps to 100 ns Frequency Range: 5 Hz to 2.5 MHz	Range: Direct: 0.4 μ s to 1.0 s; Prescale: 0.04 μ s to 1.0 s Resolution: Direct: 100 ps to 100 ns; Prescale: 10 ps to 10 ns Frequency Range: Direct: 1 Hz to 2.5 MHz; Prescale: 1 Hz to 25 MHz
Plus	Safety Certification: UL, CSA	Selectable Slope Ratio CH A : CH B Display Hold Remote Start/Stop Safety Certification: UL, CSA	Display Hold Remote Start/Stop Safety Certification: UL, CSA	Display Hold Remote Start/Stop Time Interval: CH B Safety Certification: ETL, CSA



Model CMC250 1.3-GHz Multifunction Counter

The CMC250 1.3-GHz Multifunction Counter measures sine, square and triangle wave frequency from 5 Hz to 1.3 GHz. Provides period measurements and totalize functions. Channel A is a standard 1-M Ω input for frequency measurements up to 100 MHz. Channel B is a special 50- Ω terminated input, prescaled for easy RF measurements. Time base stability is ± 10 ppm/year. This 6-pound unit is 10.5" x 8.5" x 3". Includes US power cord and manual. One-year warranty.

220X164 CMC250 Counter1-2, \$555.00 ea. 3-up, \$533.00 ea.

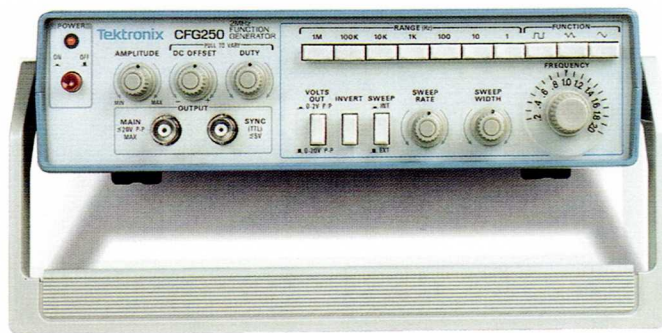


Model CMC251 1.3-GHz Multifunction Counter

Model CMC251 1.3-GHz Multifunction Counter with high-stability time base measures sine, square and triangle wave frequency from 1 Hz to 1.3 GHz. Provides period, totalize and pulse width measurements. Has two input channels. Channel A is a standard 1-M Ω input for frequency measurements up to 100 MHz. Channel B is a 50- Ω terminated input for use in high-frequency systems. Radio amateurs appreciate its ability to measure high-frequency systems. Temperature-compensated, crystal-controlled time base is stable to ± 1 ppm/year. This 3-pound unit is 10.5" x 8.5" x 3". Includes US power cord and manual. One-year warranty.

220X166 CMC251 Counter1-2, \$620.00 ea.; 3-up, \$595.00 ea.





Model CFG250

2-MHz Function Generator

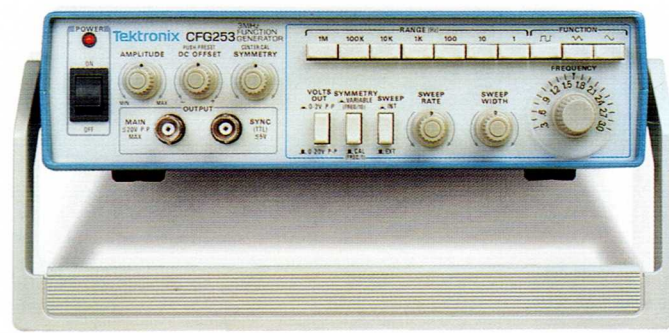
- 0.2 Hz to 2 MHz
- Square, triangle and sine waves; TTL output
- 20-dB attenuator
- Internal or external frequency sweep
- Variable duty cycle
- Variable symmetry (20 to 80%)

The CFG250 function generator produces sine, square and triangle waves plus TTL for testing amplifiers, filters and digital circuits. Sweep function can be controlled internally or with external signal. Duty cycle, dc offset, sweep rate, sweep width and amplitude are all operator controlled. The CFG250 has a bandwidth of 0.2 Hz to 2 MHz. This 4.4-pound unit is 10.75" x 10" x 3". Includes US power cord and manual. One-year warranty.

220X157 CFG250 Function Generator....1-5, \$415.00 ea.; 6-up, \$399.00 ea.

Model CFG250 Specifications

Waveform Outputs:	Square wave, sine wave, triangle wave, TTL pulse, sweep functions for all outputs
Range:	0.2 Hz to 2.0 MHz (in 7 ranges)
Frequency Multiplier:	Variable from 0.2 to 2.0 times the selected frequency range
Dial Accuracy:	±5% of full scale
Sine Wave Distortion:	<1% (10 Hz to 100 kHz)
Square Wave Response:	≤100 rise/fall time, maximum output into 50-Ω load



Model CFG253

3-MHz Function Generator

- 0.03 Hz to 3 MHz
- Square, triangle and sine waves; TTL output
- 20-dB attenuator
- Internal or external frequency sweep
- Variable duty cycle
- Variable symmetry (20 to 80%)

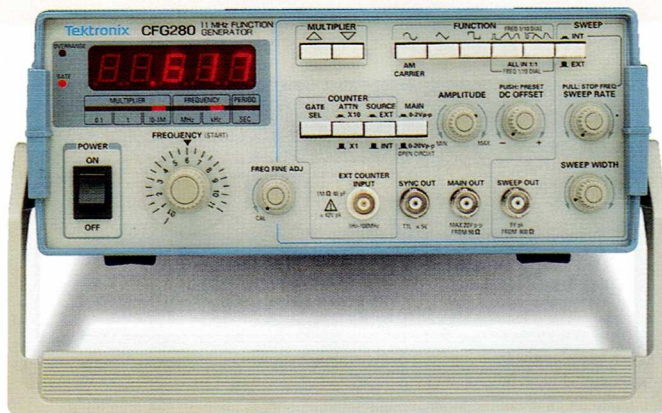
The CFG253 function generator produces sine, square and triangle waves plus TTL for testing amplifiers, filters and digital circuits. Sweep function can be controlled internally or with external signal. Duty cycle, dc offset, sweep rate, sweep width and amplitude are all operator controlled. The CFG253, at 0.03 Hz to 3 MHz, has a wider output bandwidth than the CFG250, at 0.2 Hz to 2 MHz. This 4.8-pound unit is 11" x 10.5" x 3". Includes US power cord and manual. One-year warranty.

220X159 CFG253 Function Generator....1-5, \$420.00 ea.; 6-up, \$404.00 ea.

Model CFG253 Specifications

Waveform Outputs:	Square wave, sine wave, triangle wave, TTL pulse, sweep functions for all outputs
Range:	0.03 Hz to 3.0 MHz (in 7 ranges)
Frequency Multiplier:	Variable from 0.3 to 3.0 times the selected frequency range
Dial Accuracy:	±5% of full scale
Sine Wave Distortion:	<1% (10 Hz to 100 kHz)
Square Wave Response:	≤100 ns rise/fall time, maximum output into 50-Ω load

Tektronix



Model CFG280

11-MHz Function Generator with 100-MHz Counter

- 0.1 Hz to 11 MHz (calibrated)
- 0.01 Hz to 11 MHz (uncalibrated)
- 1 Hz to 100 MHz counter
- Square, triangle and sine waves; TTL output
- 20-dB attenuator
- External gate input
- AM 0 to 100% input for external sine wave
- Internal or external frequency sweep

The CFG280 combines an 11-MHz function Generator with a 1-Hz to 100-MHz frequency counter. Onboard counter allows operator to set frequency output of function generator precisely. This versatile instrument conserves both bench space and budget. This 6.7-pound unit is 10.5" x 8.25" x 4". Includes US power cord and manual. One-year warranty.

CFG280 Function Generator

220X1621-2, \$1030.00 ea.; 3-up, \$989.00 ea.

Model CFG280 Specifications

Waveform Outputs:	Square wave, sine wave, triangle wave, TTL pulse, sweep functions for all outputs	Frequency Range:	1 Hz to 100 MHz (AC coupled)
Ranges:	0.1 Hz (calibrated) to 11 MHz in 8 ranges	Sensitivity:	30 mV rms from 1 Hz to 50 MHz, 50 mV rms from 50 MHz to 100 MHz
Frequency Multiplier:	Variable from 0.1 to 1 (uncalibrated), 1 to 11 (calibrated)	Period Range/Resolution:	1 ms to 60 s/1 ms
Dial Accuracy:	±5% of full scale from 0.1 Hz to 10 MHz	Crystal Frequency:	10 MHz
Sine Wave Distortion:	<1% (10 Hz to 100 kHz), -30 dB at all other frequencies	Time Base Stability:	±0.001% (±10 ppm) from 0° to 40° C
Square Wave Response:	≤25 ns rise/fall time, maximum output into 50-Ω load	Frequency Accuracy:	±(time base error + 1 count)
VCF (FM) Input:	±10 V input shifts frequency ≥100:1 up or down with dial set at 0.1 or 11 respectively	Period Accuracy:	±(time base error + 1 count + trigger error)





Model FG-3B

2-MHz Sweep/Function Generator

- Sine, square, triangle, TTL and CMOS outputs
- Five-digit display
- Seven frequency ranges: 0.2 Hz to 2 MHz
- Linear or logarithmic sweep
- Internal/external AM or FM

WAVETEK

Wavetek's FG-3B Sweep/Function Generator can provide a linear or logarithmic sweep of any of the selected signal outputs or perform either amplitude or frequency modulation with internal and/or external control. It features a (DCC) duty cycle control that allows for the 50% duty cycle of the output signals to be changed to any desired value and an invert button that allows you to change polarity of the signal.

Additionally, the FG-3B features a built-in five-digit frequency counter (up to 10 MHz with \pm time base accuracy) with ± 1 count accuracy and 25-mV sensitivity. A voltage-controlled frequency (VCF) control for varying frequency as a function of the VCF input and a switchable 20-dB output attenuator are also available where low signal levels are needed.

The FG-3B is built in a heavy-duty ABS housing with a cushion grip carrying handle/tilt stand, rear cord wrap and recessed top cover for easy stacking of multiple units. It weighs 4.5 pounds and measures 3.25" x 9" x 13". Supplied complete with an ac power cord, two coaxial BNC test cables, spare fuse and an operations manual.

204X003 Model FG-3B.....1-5, \$489.00 ea.; 6-up, \$465.00 ea.



Model FG-513

Sweep/Function Generator with Frequency Counter

- 2 Hz-13 MHz frequency counter range with 2-13 M frequency range
- 2 Hz-24 MHz synchronous clock frequency (TTL pulse)
- 5 Hz-100 MHz frequency counter frequency range
- Sine, square, triangle, ramp, synchronous clock and dc outputs

FG-513 is two powerful instruments for the price of one: 13-MHz sweep/function generator and intelligent 100-MHz frequency counter. Concurrent engineering design and unsurpassed innovation provide quality and reliability. Microprocessor-based device supplies menu-driven operations for quick, easy setting of waveform outputs and modes. Bright, 16-character by two-line LCD presents clear readout of generation (4-digit) and frequency counter (6.5-digit resolution). Self-test ensures correct component operation.

Continuous, triggered, gated, clock and external frequency modes plus waveforms maximize benefits and applications. Duty cycle/symmetry adjustment modifies 10%-90% waveform up to 1 MHz. Invert or non-invert TTL outputs at frequencies to 24 MHz. Attenuate amplitude of 0-40 dB at 0, 20 or 40 dB levels. Linear or logarithmic sweeps have variable rates (5 sec-10 msec) and widths. Variation of sweep width in linear or logarithmic is to 100:1.

Autoranging frequency counter adds flexibility. Read external frequencies of 5 Hz-100 MHz. Measure in frequency or period for greater accuracy and resolution at low frequencies. Built-in low pass filter measures low slew rate triangle signal and reduces interference. Signals may be attenuated at x1, x 20 nominal. The 7-pound unit is 8.7" x 3.4" x 11.8". One-year warranty.

570X713 Model FG-513.....1-2, \$875.00 ea.; 3-up, \$805.00 ea.



Model 4011

2-MHz Function Generator

- Sine, square, triangle, TTL and CMOS outputs
- Seven frequency ranges: 0.2 Hz to 2 MHz
- Voltage controlled frequency (VCF)
- Four-digit display
- Variable amplitude output

BK PRECISION
MAXTEC INTERNATIONAL CORP.

Model 4011, new from B&K Precision, is a rugged laboratory-grade instrument engineered for high-reliability and user operating convenience at an affordable cost. It generates sine, triangle and square waveforms covering 0.2 Hz to 2.0 MHz in seven ranges, plus it produces TTL pulse and CMOS pulse outputs.

Additional features include voltage-controlled frequency (VCF) input, variable amplitude output plus 20-dB step attenuator, four-digit frequency counter display, variable dc offset with on-off switch and variable duty cycle with CAL position for 50% duty cycle.

The 4011's internal frequency counter has ± 1 time base and ± 1 count accuracy. It weighs 5.5 pounds, measures 9.33" x 3.33" x 11.25" and is supplied with one cable (BNC to insulated clips), power cord, spare fuse and manual. One-year warranty.

110X904 Model 4011.....1-5, \$284.00 ea.; 6-up, \$270.00 ea.



Model 4017

10-MHz Sweep/Function Generator

- Five-digit LED frequency display
- Sine, square, triangle, \pm pulse, \pm ramp waveforms
- Frequency range 0.1 Hz to 10 MHz in eight ranges
- Operates as external frequency counter
- Wide range sweep generator

B&K Precision's Model 4017 is a sweep/function generator with digital display that's loaded with all the features of Model 4011. A versatile signal source, it generates sine, square, triangle, ramp, pulse and TTL pulse outputs. It operates in sweep, normal and VCF modes with inverted or non-inverted polarity. The five-digit display accurately indicates operating frequency. Model 4017 also operates as an external frequency counter with four steps of selectable gate time.

Specifications include variable duty cycle (15:85:15 continuously variable), impedance ($50 \Omega \pm 10\%$), attenuation (-20 dB to ± 1 dB) plus wide-range sweep generator in linear and logarithmic modes (100:1 continuously variable width).

The 4-pound 4017 measures 10.4" x 3.4" x 11.5". Comes complete with power cord and instruction manual. One-year warranty.

110X906 Model 4017.....1-5, \$369.00 ea.; 6-up, \$351.00 ea.





Model 1760

Triple Output DC Power Supply with LED Readouts

- Two 0-30 V dc outputs (independent or tracking)
- One 4-6.5 V dc output (with 0-5 A current)
- Two 3½-digit LED displays

B&K Precision's Model 1760 Triple Output DC Power Supply is a high-quality, general-purpose dc power source. It provides two supplies with a 0-30 volt dc output and one with a 4-6.5 volt dc output. The 0-30 V supplies adjust with both coarse and fine voltage controls for precision setting and are capable of current output of 0-2 amps. The 4-6.5 V supply has a current output of 0-5 amps, allowing it to handle extensive digital logic circuitry. Two large panel-mounted LED meter displays can monitor either the output current or output voltage of each supply.

The two 0-30 volt supplies can be operated independently or in one of the two tracking modes. In the series tracking mode, the Slave supply tracks the voltage of the Master supply. Maximum current setting of the two supplies can still be set independently in this mode. The Master and Slave supplies are connected in series, allowing a single output of 0-60 V at up to 2 amps. In the parallel tracking mode, the two supplies are connected in parallel, allowing a single 0-30 V output at up to 4 amps.

Specifications include: **Output Voltage Range** — 0 V (+0/-30 mV) to 30 V + (3-7%, Master and Slave); **Output Current Limit Range** — 0 A (+0/-30 mA) to 2 A + (3-7%, Master and Slave); **Load Regulation** — (Constant Voltage) <0.01% + 3 mV, Master and Slave; **Line Regulation** 108-132 V — (c.v.) <0.01% + 3 mV, Master and Slave; **Ripple** — (c.v.) <1 mV rms, Master and Slave; **Load Regulation** — (Constant Current) <0.2% + 3 mA, Master and Slave; **Load Regulation** — (Constant Voltage) <10 mV (4-6.5 V), (0-5 A load).

Model 1760 is a good choice for most other solid state electronic applications. It is ideal for service shops; industrial production testing of components, assemblies and completed equipment; school laboratories and repair depot use for field repair.

This model weighs 21 pounds and measures 5.7" (H) x 18.5" (W) x 15" (D). Each unit comes complete with two earth ground bus straps; a spare fuse; parts list; instruction manual and schematic diagram. One-year warranty.

110X660 Model 1760.....1-5, \$669.00 ea.; 6-up, \$635.00 ea.

Model 382210

Regulated Digital DC Power Supply

- Precise regulation 0.02%
- Automatic constant current and constant voltage
- Coarse and fine voltage adjustments
- Dual backlit LCDs
- Low noise and ripple ≤2mV rms

Extech's Model 382280 provides dual backlit displays and adjustable linear outputs of 0-30 volts dc and 0-3 amps. Its circuit design includes overload protection, thermal protection, short circuit protection and reverse polarity protection. The 382210 features a switchable power source of 110 V/230 V ±10%, 50/60 Hz. No overheating at maximum power output during continuous application.

Specifications include: **Output Voltage** (0-32 V); **Output Current** (0-30 A); **Constant Operation** (constant voltage regulation, 0.02% 3 mV line or load; constant current regulation, 0.2% 3 mA line or load); **Power Source** AC Input (110/230 V ac 10%, 50/60 Hz); **Power Consumption** (150 W).

Model 382210 measures 7.5" x 4.5" x 13" and weighs 17 pounds. One-year warranty.

160X220 Model 382210.....1-5, \$369.00 ea.; 6-up, \$351.00 ea.



EXTECH
INSTRUMENTS



Model 1686

High-Current DC Power Supply

- Variable output: 3-14 V dc
- Substitutes for auto or truck battery
- Features reverse polarity, overload and short circuit protection
- Connect two or more in parallel to double current or in series to double voltage

Model 1686 is a rugged, high-current power supply built to withstand continuous duty. If you have been using car batteries to power mobile equipment, you are aware of the drawbacks. Car batteries are heavy, leak acid, spark, can't tolerate shorted outputs, damage clothing and must be recharged. Model 1686 overcomes all of these faults while providing 12-amp continuous duty at 13.8 volts dc without overheating. For more output, simply connect two or more power supplies in parallel or series.

This compact, inexpensive power supply substitutes for an auto or truck battery. This power supply is ideal for servicing and demonstrating high-power car stereos, powering car stereo displays, servicing camcorders and powering ham radios.

Specifications include: **Output Voltage** (3-14 V dc); **Output Current** (proportional to output voltage, 2.5 A @ 3 V, 4.5 A @ 5 V, 7.5 A @ 9 V, 10 A @ 12 V, 12 A @ 13.8 V dc); **Load Regulation** (±0.8%); **Line Regulation** (±0.8% from 108 to 132 V ac); **Noise and Ripple** (10 mV rms maximum); **Voltmeter Range** (0-20 V); **Ammeter Range** (0-20 A); **Voltmeter/Ammeter Accuracy** (±7% of full scale); **Power Requirements** (120/220 V ac ±10%, 50/60 Hz, 400 W).

Model 1686 comes with a spare fuse and an instruction manual. The 12.1-pound unit is 5.5" x 5.9" x 12". One-year warranty.

110X665 Model 1686.....1-5, \$199.00 ea.; 6-up, \$189.00 ea.



Model 1711

Economical DC Power Supply

- Output voltage: 0-60 V dc, continuously variable
- Output current: 0-2 A in four ranges
- Fully adjustable shutdown, adjustable current limit
- Perfect for solid-state servicing

B&K's Model 1711 is a laboratory-quality power supply that is a combination of on/off voltage output and separate standby control. It assures zero output voltage when the power supply is first turned on. Included are such performance features as fail-safe automatic overload protection that includes instantly resettable, single push-button control for current limit setting and resetting after overload.

Current limit does not require a short circuit condition, and a standby switch has been added so that it disconnects the load for safe, quick adjustments without disturbing voltage or current settings.

The 1711 power supply exhibits outstanding specifications including: **Input Voltage** (108-132 V ac); **Output Voltage** (0-60 V dc, continuously variable); **Output Current** (0-2 A in two ranges: 0-.55 A, 0-2.2 A); **Load Regulation** (<0.01% + 3mV); **Line Regulation** (<0.01% + 3mV from 108 to 132 V ac with output of 60 V dc and 2 A).

Model 1711 measures 6.2" x 5.5" x 12.5" and weighs 13 pounds. Supplied accessories are spare fuses, parts list, instruction manual and schematic diagram. One-year warranty.

110X601 Model 1711.....1-5, \$309.00 ea.; 6-up, \$294.00 ea.



PS280 Series

Laboratory DC Power Supplies

Versatile Tektronix PS280 Series benchtop or portable power supplies suit a wide range of test and lab requirements. These five multi-function models are ideal for training, manufacturing production testing, field repair, bench calibration and repair plus product design. Each safe, reliable TekBench offers high value in an affordable instrument.

Tektronix

Models PS281/PS282

Single-Output Power Supplies

- 90-W, 3½-digit display
- 0-30 V/0-3 A (PS281); 0-18 V/0-5 A (282)
- Variable current limiting
- Overload and over-voltage protection

The Tektronix PS281 and PS282 Single-Output Power Supplies meet the requirements of laboratory, classroom and production environments. PS 281 is rated at 30 V/3 A; PS282 is rated at 18 V/5 A max. Output is continuously variable up to rated voltage/current by means of coarse and fine potentiometers.

Both models are designed to be connected in series to increase voltage output or in parallel for a higher current output. Achieve serial and parallel tracking by connecting rear panel jumper between two or more units. Compact case size and multiple operating modes offer convenience and flexibility for space-limited engineering benches.

PS281 includes one pair of test leads, U.S. power cord and instruction manual. The 11-pound unit is 5" x 5.7" x 11.2". PS282 includes three pairs of test leads, U.S. power cord and operator's manual. This 8.8-pound unit is 5" x 5.7" x 11.2". One-year warranty.

PS281 Single-Output 30-V/3-A Power Supply

220X761.....1-2, \$405.00 ea.; 3-up, \$389.00 ea.

PS282 Single-Output 18-V/5-A Power Supply

220X762.....1-2, \$405.00 ea.; 3-up, \$389.00 ea.

Connect single-output supplies in series to increase voltage or in parallel to increase current. Achieve serial and parallel tracking by connecting rear panel jumper between two or more units. Multiple operating modes and compact case offer convenience and flexibility.

Triple-output models feature three independent power supplies in a single package. They contain one fixed and two identical, independently adjustable dc power supplies that can

vary from 0-30 V and 0-2 A. Use front panel switches to select one of three modes of operation: independent, series or parallel.

Control output voltage and current of each supply independently in independent mode. In two tracking modes, variable outputs are connected in series or parallel. The right (master) power supply's controls adjust voltages or current of both power supplies.



Models PS280/PS283

Triple-Output Power Supplies

- One fixed 5-V, 3-A supply
- Two variable outputs: 0-30 V/2 A (PS280); 0-30 V/1 A (PS283)
- Variable current limiting
- Selectable independent tracking mode
- Dual tracking: variable 0-30 V/2 A (PS280); 0-30 V/1 A (PS283)

Tektronix Models PS280 and PS283 are triple-output, multifunction benchtop or portable instruments. These regulated power supplies provide a fixed 5-V output for powering logic circuits plus two variable outputs for a wide variety of test and experimental uses.

Model PS280 contains two identical, independently adjustable dc power supplies that can vary from 0 to 30 V and 0 to 2 A (0 to 1 A for the PS283). Use the front-panel switches to select one of three modes of operation: independent, series or parallel.

Both units include three pairs of test leads, U.S. power cord and operator's manual. The 25.4-pound PS280 is 5.7" x 10" x 13.2". The 22.1-pound PS283 is 5.7" x 10" x 13.2". One-year warranty.

PS280 Triple-Output 0 to 30-V/2-A Power Supply

220X760.....1-2, \$725.00 ea.; 3-up, \$696.00 ea.

PS283 Triple-Output 0 to 30-V/1-A Power Supply

220X763.....1-2, \$699.00 ea.; 3-up, \$671.00 ea.



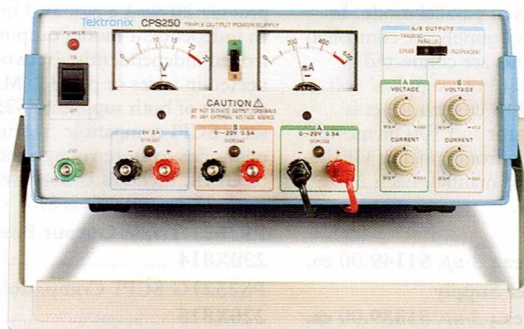
Model CPS250

Triple-Output Power Supply

- Two variable 0 to 20-V/0.5-A supplies
- Fixed 50-V/2-A supply
- Variable current limiting
- Overload indicators

Model CPS250 is a versatile triple-output instrument with two variable and one fixed output. Its attractive, compact design with tilt-bail handle takes up less bench space than other power supplies. It meets most basic test and lab bench requirements.

CPS250 contains two identical, indepen-



dently adjustable dc power supplies that you can vary from 0 to 20 V and 0 to 500 mA. Front panel switches select one of three modes of operation: independent, series or parallel. In independent mode, output voltage can be controlled independently. In the two tracking modes, variable outputs are connected either in series or in parallel.

Includes three pairs of test leads, U.S. power cord and manual. The 13-pound unit is 7.5" x 9.5" x 3.9". One-year warranty.

CPS250 0 to 20-V/0.5-A Power Supply

220X174 ..1-2, \$495.00 ea.; 3-up, \$475.00 ea.

PS280 Series Power Supply Specification Comparison

	PS281		PS282		PS280		PS283		CPS250	
					Two Variable	One Fixed	Two Variable	One Fixed	Two Variable	One Fixed
Output Voltage	0-30 V dc		0-18 V dc		0-30 V dc	5.0 V	0-30 V dc	5.0 V	0-20 V dc	5.0 V dc
Output Current	0-3.0 A		0-5.0 A		0-2.0 A (CC)	3.0 A max	0-1.0 A (CC)	3.0 A max	0-0.5 A (CC)	2.0 A max
Line Regulation	≤0.01% + 3 mV		≤0.01% + 3 mV		0.01% + 3 mV (CV) 0.2% + 3 mA (CC)	≤5 mV (CV)	≤0.01% + 5 mV (CV) 0.2% + 3 mA (CC)	≤5 mV (CV)	0.01% + 3 mV (CV) 0.2% + 3 mA (CC)	≤10 mV (CV)
Load Regulation	≤0.01% + 3 mV		≤0.01% + 3 mV (≤3 A) ≤0.01% + 5 mV (>3 A)		≤0.1% + 5 mV, current >3 A (CV) ≤300 mV, 0-60 V single series tracking supply (CV) 0.2% + 3 mA (CC)	≤10 mV (CV)	≤0.1% + 3 mV (CV) ≤300 mV, 0-60 V single series tracking supply (CV) 0.2% + 3 mA (CC)	<10 mV (CV)	0.01% + 3 mV (CV) 0.2% + 6 mA (CC)	0.01% + 5 mV (CV)
Ripple/Noise	≤0.5 mV rms, 5 Hz-1 MHz		≤0.5 mV rms, 5 Hz-1 MHz (≤3 A) ≤1.0 mV rms, 5 Hz-1 MHz (>3 A)		≤1 mV rms, 5 Hz-1 MHz (CV); ≤3 mA (CC)	≤2 mV rms	≤1 mV rms, 5 Hz-1 MHz (CV); ≤3 mA (CC)	≤2 mV rms	2 mV rms, 5 Hz-1 MHz (CV) 3 mA rms, 5 Hz-1 MHz (CC)	2 mV rms
Accuracy	±(0.5% of reading + 2)		±(0.5% of reading + 2)		-	-	-	-	-	-



PS2500 Series

Programmable Benchtop Power Supplies

Manual and computer-controlled Tektronix Programmable Benchtop Power Supplies meet your needs. These TekBench models are high-value yet affordable basic instruments. Use these safe, reliable tools for troubleshooting and performance verification applications in training, manufacturing production testing, field repair, bench calibration and repair plus product design.

The PS2500 Series consists of single-variable-output and triple-variable-output versions. With SCPI-compatible GPIB interface, use "G"



models with low-cost, computer-controlled systems. Each PS2500 model has 100 memory locations for storing voltage and current limits that can be recalled instantly via the front panel. Triple-output versions have three variable outputs for operation in series, parallel or independent modes. The output voltage current of each supply is controlled separately in independent mode. In tracking modes, outputs are connected in series or parallel. The master power supply's controls regulate the voltage or current of both outputs.

Choose from four single- and four triple-output models to meet your basic test and laboratory requirements.

Models PS2510/PS2510G

Single-Output Programmable Power Supplies

- 0-36 V/0-3.5 A
- PS2510G is SCPI compatible

The single-output PS2510/PS2510G are suited to low-cost computer-controlled systems. They provide 36 V/3.5 A max. PS2510G is GPIB programmable; GPIB command sets are SCPI compatible. Each supply features digital LED and 100 memories to store voltage and current limits for instant recall via front panel or GPIB. With test lead pair, U.S. power cord and manual. Each 24-pound unit is 5.7" x 10" x 13.6". One-year warranty.

PS2510 Single-Output Power Supply

220X7891-2, \$925.00 ea.; 3-up, \$888.00 ea.

PS2510G SCPI-Compatible Single-Output Power Supply

220X7901-2, \$1130.00 ea.; 3-up, \$1085.00 ea.

Models PS2520/PS2520G

Triple-Output Programmable Power Supplies

- One 0-6 V/0-3 A; two 0-36 V/0-1.5 A
- PS2520G SCPI compatible

Versatile PS2520/PS2520G triple-output power supplies are suited to many applications. A single supply provides 6 V/3 A max; two supplies provide 36 V/1.5 A max. Operate in independent, series or parallel mode. In independent mode, output voltage and current of each supply are controlled independently. In two tracking modes, variable outputs are connected in series or parallel. Master power supply's controls adjust both supplies' voltage or current. PS2520G is GPIB programmable; GPIB command set is SCPI compatible. Features digital LED output indicator and 100 memories to store voltage and current limits for instant recall via front panel or GPIB. Includes U.S. power cord, black/red test lead pair and manual. Each 25-pound unit is 5.7" x 10" x 13.6". One-year warranty.

PS2520 Triple-Output Power Supply

220X8101-2, \$1195.00 ea.; 3-up, \$1149.00 ea.

PS2520G SCPI-Compatible Triple-Output Power Supply

220X8111-2, \$1395.00 ea.; 3-up, \$1339.00 ea.

Models PS2511/PS2511G

Single-Output Programmable Power Supplies

- 0-20 V/0-7 A
- PS2511G is SCPI compatible

PS2511/PS2511G single-output power supplies are ideal for low-cost computer-controlled systems. They are rated to 20 V/7 A. PS2511G is GPIB programmable; GPIB command set is SCPI compatible. Features digital LED and 100 memories to store voltage and current limits for instant recall via front panel or GPIB. Includes test lead pair, U.S. power cord and manual. Each 24-pound unit is 5.7" x 10" x 13.6". One-year warranty.

PS2511 Single-Output Power Supply

220X7921-2, \$925.00 ea.; 3-up, \$888.00 ea.

PS2511G SCPI-Compatible Single-Output Power Supply

220X7931-2, \$1130.00 ea.; 3-up, \$1085.00 ea.

Models PS2521/PS2521G

Triple-Output Programmable Power Supplies

- One 0-6 V/0-5 A; two 0-20 V/0-2.5 A
- PS2521G SCPI compatible

The versatile triple-output PS2521/PS2521G power supplies are suitable for many applications. A single supply provides 6 V/5 A max; two supplies provide 20 V/2.5 A max. Operate in independent, series or parallel mode. In independent mode, output voltage and current of each supply are controlled independently. In two tracking modes, variable outputs are connected in series or parallel. Master power supply's controls adjust voltage or current of both supplies. PS2521G is GPIB programmable; GPIB command set is SCPI compatible. Features digital LED output indicator and 100 memories to store voltage and current limits for instant recall via front panel or GPIB. Includes U.S. power cord, black/red test lead pair and manual. Each 25-pound unit is 5.7" x 10" x 13.6". One-year warranty.

PS2521 Triple-Output Power Supply

220X8141-2, \$1195.00 ea.; 3-up, \$1149.00 ea.

PS2521G SCPI-Compatible Triple-Output Power Supply

220X8151-2, \$1395.00 ea.; 3-up, \$1339.00 ea.

PS2500 Series Programmable Power Supply Specification Comparison

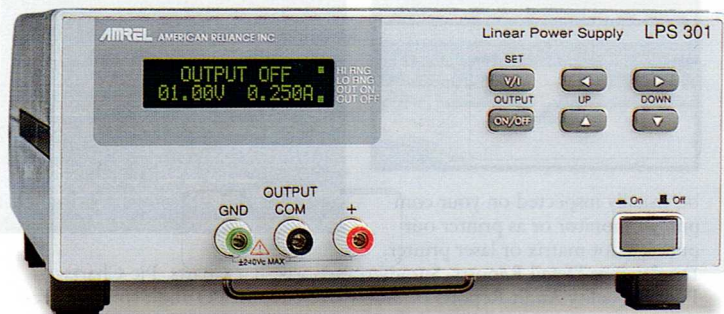
	PS2510/PS2510G	PS2511/PS2511G	PS2520/PS2520G	PS2521/PS2521G
Number of Outputs	1	1	3	3
Output Voltage	0-36 V	0-20 V	0-6 V 0-36 V (two)	0-6 V 0-20 V (two)
Output Current	0-3.5 A	0-7 A	0-3 A (6 V) 0-1.5 A (36 V)	0-5 A (6 V) 0-2.5 A (20 V)
Voltage Accuracy	0.025% + 25 mV	0.025% + 25 mV	0.05% 5 mV + 25 mV	0.05% 5 mV + 25 mV
Current Accuracy	0.2% + 10 mA	0.2% + 10 mA	0.2% + 10 mA	0.2% + 10 mA
Programmable Voltage Resolution	10 mV	10 mV	10 mV	10 mV
Programmable Current Resolution	1 mA	1 mA (2 mA >3.5 A)	1 mA	1 mA
Display	Digital, LED	Digital, LED	Digital, LED	Digital, LED
Auto-Series/Parallel Operation	N/A	N/A	Yes	Yes
Auto-Master/Slave Tracking	N/A	N/A	Yes	Yes
Internal Memory	100	100	100	100
GPIB (SCPI)	PS2510G	PS2511G	PS2520G	PS2521G
Safety Certifications	ETL, CSA	ETL, CSA	ETL, CSA	ETL, CSA



LPS-Series Linear Power Supplies

American Reliance introduces a new family of linear power supplies with unique features at competitive prices. All controls and connections except for ac power input are conveniently located on the front. The LPS-Series offers such impressive features as keypad data entry, digital LCD, power-off memory, output enable/disable and CPU control.

A built-in data entry keypad has 16 multi-purpose keys for programming desired output levels. Specific settings are achieved by simply selecting the desired function key, keying in appropriate setting and pressing enter. Combined binding post/banana jacks are clearly marked and color coded to make reliable output connections fast and easy. The 16-character, two-line, backlit LCD accurately indicates output level, settings and control functions. Power-off memory retains settings to speed start-up the next time the unit is turned on. Output enable/disable allows turning off the output to make adjustments without turning off the power supply. CPU control allows faster and more accurate settings than are possible with other power supplies. Choose from three LPS models.



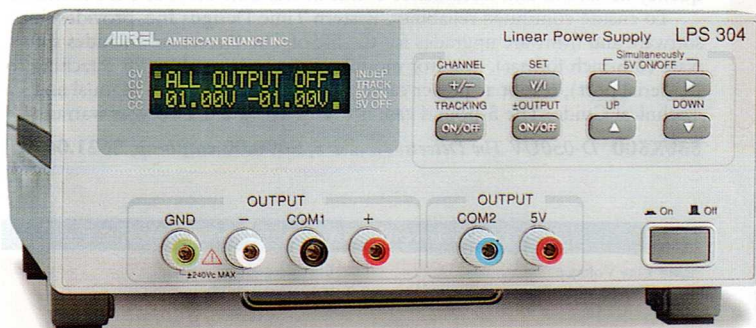
LPS-301

Single-Channel Linear Power Supply

- Maximum output power: 30 watts
- Dual output: 0-15 volts/2 amps or 0-30 volts/1 amp

The LPS-301 is a low-end linear power supply offering either 0 to 15-volt/2-amp or 0 to 30-volt/1-amp output. Peak output voltage is 32 V/16 V with 10 mV setting resolution. Peak output current is 2.4 A/1.2 A with 1 mA resolution. Model LPS-301 offers constant voltage/current characteristics of 1 mV/2 mA ($\pm 10\%$ ac) line regulation and load regulation (100% load change) of 2 mV/5 mA. Ripple and noise are rated at 1 mV rms/1 mA rms and 10 mV/5 mA p-p (10 Hz-20 MHz). The 10-pound LPS-301 measures 8.7" x 3.4" x 11.8". Two-year warranty.

570X761 LPS-3011-5, \$249.00 ea.; 6-up, \$229.00 ea.



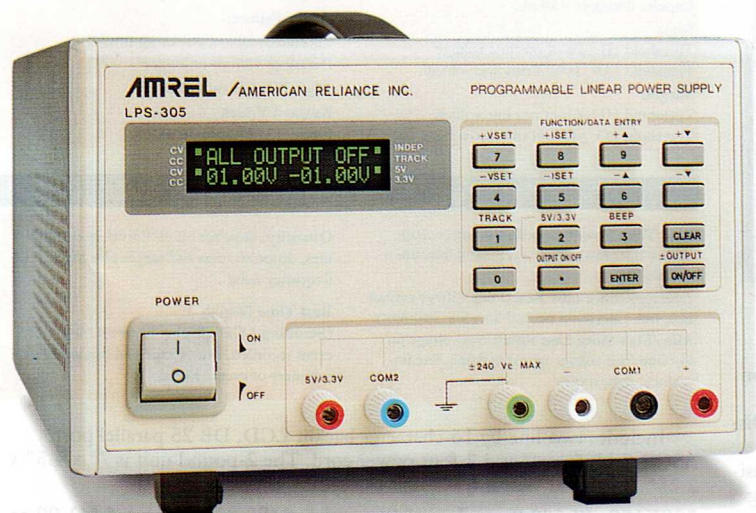
LPS-304

Triple-Channel Linear Power Supply

- Maximum output power: 70 watts
- Triple output: ± 30 volts/1 amp and 5 volts/2 amps

This triple-output linear power supply offers ± 0 to 30-volt/1-amp and 0 to 5-volt/2-amp output. Peak output voltage is ± 32 V/5 V with 10 mV setting resolution. Peak output current is 1.2 A/2.4 A with 1 mA resolution. Model LPS-304 offers constant voltage/current characteristics of 1 mV/5 mV/2 mA ($\pm 10\%$ ac) line regulation and load regulation (100% load change) of 2 mV/10 mV/5 mA. Ripple and noise are rated at 1 mV rms/2 mV rms/1 mA rms and 10 mV/5 mA p-p (10 Hz-20 MHz). The 12-pound LPS-304 measures 8.7" x 3.4" x 11.8". Two-year warranty.

570X768 LPS-3041-5, \$399.00 ea.; 6-up, \$367.00 ea.



LPS-305

Triple-Channel, High-Wattage Linear Power Supply

- Maximum output power: 165 watts
- Triple output: ± 30 volts/2.5 amps and 5 volts or 3.3 volts/2 amps

Model LPS-305 is a triple-output, high-wattage linear power supply offering ± 0 to 30-volt/2.5-amp and 0 to 5-volt or 0 to 3.3-volt/2-amp output. Peak output voltage is ± 32 and 5 or 3.3 V with 10 mV setting resolution. Peak output current is 3 A/3 A/3 A with 1-mA resolution. Model LPS-305 offers constant voltage/current characteristics of 1 mV/5 mV/2 mA ($\pm 10\%$ ac) line regulation and load regulation (100% load change) of 2 mV/10 mV/5 mA. Ripple and noise are rated at 1 mV rms/2 mV rms/1 mA rms and 10 mV/5 mA p-p (10 Hz-20 MHz). The 18-pound LPS-305 measures 8.7" x 5.2" x 15.7". Two-year warranty.

570X770 LPS-3051-5, \$599.00 ea.; 6-up, \$550.00 ea.



The Detective™ PC Edition

PC-Based Power Line Monitor

- Complete ac power analysis includes spikes, dropouts, power failures, line voltage, common mode noise, sags and surges, phase shift, line frequency and high-frequency noise
- Simple to operate for fast, accurate reporting and analysis
- Universal voltage works on 110- or 220-line
- Accepts voltage from 80-300
- Five-year battery-backed RAM memory
- Free software and firmware upgrades for life

D-050 System Requirements

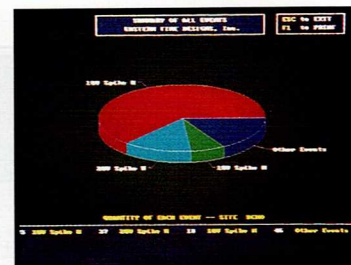
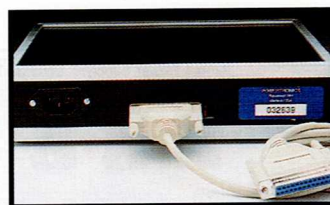
- IBM or compatible XT, AT, 286 or 386
- At least one 360-K or 1.2-MB floppy drive
- Minimum of 512-K system memory
- 80 column monitor (monochrome or color)
- One of the following graphics-supporting video cards: HGC, CGA, EGA or VGA
- Optional dot matrix or laser printer

Plug monitor module into suspect ac line for 24-72 hours (or any length of time). Connect it to your IBM or compatible PC, start host program, and The Detective does the rest! No difficult setup and no training!

Don't be misled by its simplicity. The Detective is a powerful, fully featured ac line monitor. It can monitor the power line as a stand-alone unit or report events immediately to your computer screen. The Detective stores 1500 detail events with 256,000 summary events for each type of event.

Custom-designed Power Audit software automatically retrieves accumulated data and compiles it into power quality analysis reports. Charts contain actual disturbance event data, indicate symptoms related to disturbance types and specify solutions. Easy-to-understand reference or audit information can

Finally, a powerful and fully-featured universal voltage power line monitor at an affordable price. The Detective™ PC Edition is designed to work with any IBM-type PC to provide a complete analysis of your ac power for a fraction of the cost of other monitors. Its ease of use sets The Detective apart from the competition.



The Detective Specifications

Function	Range	Response Accuracy	Time Other
AC Line Voltage (rms)	80-300 V	±1.5%	100 ms
Neutral Line Voltage (rms)	N/A	±1.5%	100 ms
AC Voltage Spike Analysis	N/A	±10%	N/A
High Line Voltage (Surge)	80-300 V	±1.5%	16 ms
Low Line Voltage (Sag)	80-300 V	±1.5%	16 ms
High-Frequency Noise	N/A	1 ms	Amplitude: ±2 V p-p; Frequency: 10 kHz-10 MHz
Line Frequency	40-70 Hz	±1%	1 ac cycle
Common Noise Mode		10%	Min Duration: 750 ns; Trigger: 5, 10, 50, 100, 500, 1000 V

be visually inspected on your computer's monitor or as printer output to a dot matrix or laser printer.

Display it as Detail Reports, Summary Reports, Bar Charts, Pie Charts, Power Quality Audit Reports or Sine Wave Graphs. PQ audit solution section is user programmable to include power protection products carried by user. Time, date and site information is also user programmable.

Installation in any IBM or compatible PC is simple. Unique audit software is "plug-n-play" ready with all typical thresholds set at factory standards. It can be infinitely customized for obtaining the exact information required. View the power under analysis on line for both voltage and frequency deviations and disturbance events in real time on your PC's monitor.

To ensure continued reliability, Eastern Time Designs Inc. provides free software and firmware upgrades for the life of The Detective! Includes software (3.5-inch format), monitor module, null modem cable (for attaching to PC serial port), 6-foot ac power cable plus detailed Reference Manual and Technical Guide. The 5-pound case is 8.4" x 10" x 2". Two-year warranty.

530X500 D-050UV The Detective1-5, \$690.00 ea.; 6-up, \$621.00 ea.

Power Investigator

Power Disturbance Monitor

- Records sags, power failures, spikes, ac voltage, high-frequency noise, surges, dropouts, common mode noise and line frequency
- Voltage range: 80-300 volts ac
- Memory storage: 65,000 stored of each event type
- No programming needed: just plug in and record
- Thresholds programmed at factory settings

Finally, a power monitor that helps you solve power problems quickly and easily. The easy-to-operate Power Investigator simply plugs into your ac wall outlet. Monitor your power for a few hours or several days, and the PI-500 will record and save power problems in battery-backed memory. Data retention is three days without power.

Connect PI-500 to a parallel printer using a standard printer cable. It provides a complete count of all power disturbance events that happened on your powerline. With unit on and connected, turn printer's on-line switch on-off-on. It will download the following reports to your printer. Power Disturbance Report counts all power disturbances detected. Cause and Effect Chart explains actual types of disturbances recorded and their effect on sensitive equipment. Power Solutions Report takes the guesswork out of solving the power problems that actually occurred during power monitoring.



Power Investigator Specifications

RMS Line Voltage: Range: 80-300 V ac rms Accuracy: ±1.5%	Line Frequency: Range: 40-400 Hz Accuracy: ±1.5%
Impulses: Levels hot line: 20, 50, 100, 500 V Levels neutral line: 20, 50, 100, 500 V Accuracy: ±10% Impulse duration: 750 ns	Threshold: ±2%
Sags: Threshold HI: -5% of rms line voltage Threshold LO: -10% of rms line voltage	Dropout: Threshold: 50% of power-up rms V Duration: 100 ms or longer
Surges: Threshold HI: ±5% of rms line voltage Threshold LO: +10% of rms line voltage	Power Failure: Threshold: 50% of power-up rms V Duration: 100 ms or longer
	High-Frequency Noise: Range: 2 V peak Frequency: 10 kHz-10 MHz

PI-500 Reports

Real Time Power Conditions: rms voltage on hot line, rms voltage on neutral line, line frequency	Quantity: impulses on each level, power failures, dropouts, sags and surges plus high-frequency noise
Averages Since Last Reset: rms voltage on hot line, rms voltage on neutral line, line frequency	Real Time Display (Scrolling LCD Display Shows): most recent event recorded, rms voltage and frequency plus summary of events stored
Min/Max Since Last Reset: rms voltage on hot line, rms voltage on neutral line, line frequency, sags, surges	

Includes two-line by 16-character backlit LCD, DB 25 parallel port, ASCII 7-bit format and 2-foot power cord. The 2-pound unit is 7" x 4.5" x 2.25". Two-year warranty.

530X150 PI-500 Power Investigator1-5, \$490.00 ea.; 6-up, \$441.00 ea.





PQR 2020 Power Quality Recorder Four-Channel AC Voltage Recorder

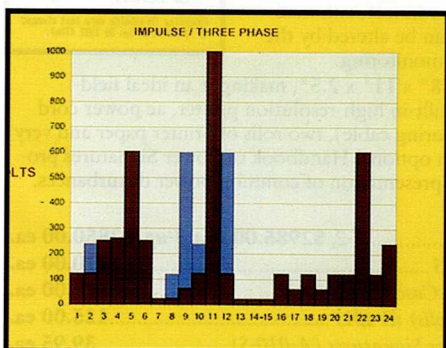
- Prove power problems exist
- Reduce downtime
- Reduce service calls
- Perform pre-site testing

The PQR 2020 Power Quality Recorder is an ac voltage disturbance recorder and voltage logger for single-, dual- and three-phase power lines. Isolating and solving voltage problems that affect your equipment is easy with the PQR 2020. Test voltage disturbances and voltage levels. Once a signal is applied, the unit auto-scales to the correct voltage range. No programming is required. The unit is pre-set to factory settings. Simply hook the PQR up to the voltage signal, and it immediately starts to monitor the line for disturbances and voltage values. Sag and surge thresholds are user programmable.

Use the PQR for independent monitoring. It will record events as a stand-alone recorder. This unit can record events unattended for a few hours or several weeks. All events are stored in a battery-backed RAM memory chip. If the unit loses power, all events stay recorded internally. Each model has time and date stamped memory locations for specific events and voltage log. The PQR time and date stamps power disturbances so the user can correlate power problems to system problems. Provides up to 1500 time and date stamped events per input channel. Summary memory counts up to 65,000 events. Create custom reports using your own familiar software.

This 4-pound unit measures just 2" x 10" x 8" and comes with an 18-month warranty.

530X318.....PQR 2020
1-2, **\$3485.00 ea.**
3-up, **\$137.00 ea.**



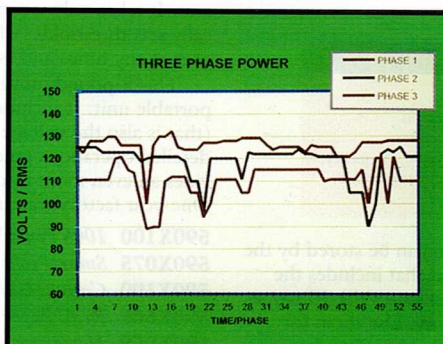
PowerTronics

PQR 2020
Three Phase Test
Ver V1.7 (c)Copyright 1995, 1996

Data Log of Voltage on Ch1, Ch2, Ch3, and N

May,23,96, 16:42:00, 0,0,0,0,0
May,23,96, 16:43:00, 89,89,89,0,0
May,23,96, 16:44:00, 119,119,119,0,0
May,23,96, 16:45:00, 119,120,119,0,0
May,23,96, 16:46:00, 119,119,119,0,0
May,23,96, 16:47:00, 119,119,119,0,0
May,23,96, 16:48:00, 119,119,119,0,0
May,23,96, 16:49:00, 119,119,119,0,0
May,23,96, 16:50:00, 119,121,119,0,0
May,23,96, 16:51:00, 119,120,119,0,0
May,23,96, 16:52:00, 116,119,119,0,0
May,23,96, 16:53:00, 116,119,119,0,0
May,23,96, 16:54:00, 115,119,119,0,0
May,23,96, 16:55:00, 114,119,119,0,0
May,23,96, 16:56:00, 114,119,119,0,0
May,23,96, 16:57:00, 114,119,119,0,0
May,23,96, 16:58:00, 115,119,119,0,0
May,23,96, 16:59:00, 114,120,119,0,0
May,23,96, 17:00:00, 114,119,119,0,0
May,23,96, 17:01:00, 113,119,119,0,0
May,23,96, 17:02:00, 113,119,119,0,0
May,23,96, 17:03:00, 114,119,119,0,0
May,23,96, 17:04:00, 113,119,119,0,0
May,23,96, 17:05:00, 114,119,119,0,0
May,23,96, 17:06:00, 115,119,119,0,0
May,23,96, 17:07:00, 115,119,119,0,0
May,23,96, 17:08:00, 115,119,119,0,0
May,23,96, 17:09:00, 116,119,120,0,0
May,23,96, 17:10:00, 116,119,120,0,0
May,23,96, 17:11:00, 115,119,120,0,0
May,23,96, 17:12:00, 116,119,120,0,0
May,23,96, 17:13:00, 116,119,121,0,0
May,23,96, 17:14:00, 117,119,121,0,0
May,23,96, 17:15:00, 118,119,121,0,0
May,23,96, 17:16:00, 118,119,121,0,0
May,23,96, 17:17:00, 118,119,121,0,0
May,23,96, 17:18:00, 119,119,121,0,0
May,23,96, 17:19:00, 119,119,122,0,0
May,23,96, 17:20:00, 119,119,121,0,0

(voltage sample rate at 1 sample/minute, the 2020 will store 11 days of samples at this rate)



PowerTronics

Sample Printout

Model: PQR 2020 Three Phase

May 24,96 12:21:35.95
Ver V1.7 (c)Copyright 1995, 1996

Summary report of all events detected

(Counts up to 65,000 of each Event type)

Phase 1,	Impulse, 20 V Peak,	6
Phase 1,	Power Restore,	1
Phase 1,	Surge, 5 Percent,	1
Phase 1,	Surge, 10 Percent,	1
Phase 2,	Impulse, 20 V Peak,	6
Phase 2,	Power Restore,	1
Phase 2,	Surge, 10 Percent,	1
Phase 3,	Impulse, 20 V Peak,	7
Phase 3,	Power Restore,	1
Phase 3,	Surge, 5 Percent,	1
Phase 3,	Surge, 10 Percent,	1

Detail report of all events detected

(Stores up to 1,500 time and date stamped events Per channel)

May,23,96, 16:43:14.46, Phase 2, Impulse, 20 V Peak,
May,23,96, 16:43:14.46, Phase 3, Impulse, 20 V Peak,
May,23,96, 16:43:14.76, Phase 2, Power Restore, 59 V RMS,
May,23,96, 16:43:14.76, Phase 3, Power Restore, 69 V RMS,
May,23,96, 16:43:14.94, Phase 1, Power Restore, 78 V RMS,
May,23,96, 16:43:14.94, Phase 2, Surge, 10 Percent,
May,23,96, 16:43:14.94, Phase 3, Surge, 10 Percent,
May,23,96, 16:43:15.17, Phase 1, Surge, 5 Percent,
May,23,96, 16:43:15.24, Phase 1, Surge, 10 Percent,
May,23,96, 16:50:54.56, Phase 3, Impulse, 20 V Peak,
May,23,96, 16:51:57.95, Phase 1, Impulse, 20 V Peak,
May,23,96, 16:51:57.95, Phase 2, Impulse, 20 V Peak,
May,23,96, 16:51:57.95, Phase 3, Impulse, 20 V Peak,
May,23,96, 16:52:40.84, Phase 1, Impulse, 20 V Peak,
May,23,96, 16:52:40.84, Phase 2, Impulse, 20 V Peak,
May,23,96, 16:52:40.84, Phase 3, Impulse, 20 V Peak,
May,23,96, 17:13:55.92, Phase 3, Surge, 5 Percent,
May,24,96, 09:18:36.56, Phase 1, Impulse, 20 V Peak,
May,24,96, 09:18:36.56, Phase 2, Impulse, 20 V Peak,
May,24,96, 09:18:36.56, Phase 3, Impulse, 20 V Peak,
May,24,96, 10:22:34.45, Phase 1, Impulse, 20 V Peak,
May,24,96, 10:22:34.45, Phase 2, Impulse, 20 V Peak,
May,24,96, 10:22:34.45, Phase 3, Impulse, 20 V Peak,
May,24,96, 12:19:22.69, Phase 1, Impulse, 20 V Peak,
May,24,96, 12:19:22.69, Phase 3, Impulse, 20 V Peak,
May,24,96, 12:19:23.57, Phase 1, Impulse, 20 V Peak,
May,24,96, 12:19:23.57, Phase 2, Impulse, 20 V Peak,

PQR 2020 Custom Reports

Uploading data from the PQR: Utilize any standard communication program to upload data into a text file on your PC's hard drive. The PQR stores data in a standard comma delimited ASCII text file which is accepted by most commercially available spreadsheet or word-processing programs. Sample programs: Pro-Com, Windows Terminal, Comit.

Generating reports: Once uploaded, the user can import the data into familiar spreadsheet or word-processing software. Using imported data, choose line charts, graphs or standard text to display or print data from the PQR. See printout samples. Sample programs: Microsoft Word, Excel, Lotus 123.

PQR 2020 Specifications

AC VOLTAGE TESTING

Three AC Voltage Inputs: Range (80-520 volts); frequency (40-400 Hz); 100, 120, 240, 277, 480

One Neutral Line Voltage Input: Neutral to ground impulse testing; voltage data logging

DATA LOGGING

Three channels ac power
One channel neutral line

DISTURBANCE TESTING

Three input channels for three-phase line
Sags/surges, impulses, dropouts, power failure, high-frequency noise, line voltage/frequency





100S PowerVisa

Our Most Comprehensive AC Power Monitor

- Bright LED warning lights for excellent visibility
- AUTO PRINT feature prints event reports automatically
- Built-in TEMPERATURE-measuring function
- Automatically measures CURRENT with optional probe
- All functions easily accessed by push-button operation

The new 100S PowerVisa monitors the power line continuously and provides a printed record of all potentially damaging power disturbances. This lets you quickly separate power-related problems from equipment failures and prevents you from wasting valuable time chasing problems that don't exist. The PowerVisa monitors wiring problems, power failures, swells, sags, frequency, impulses, waveshape faults, neutral-ground voltage, high frequency noise, temperature — even current (with optional probe).

This microprocessor-based instrument incorporates features not found on any other power line monitors — at any price! Features include an ADVICE button that provides you with reliable information on what may be causing your power problem and how to correct it. The HELP! button provides you with instantaneous assistance via a built-in, comprehensive User's Guide with just the touch of a button.

100S PowerVisa Specifications

Operating Ranges	Measurements
AC Voltage: -90 to 290 V rms	Power Failures, Sags, Swells Waveshape Faults, Impulses
Frequency: 50/60 Hz	Total Harmonic Distortion, Frequency, High Frequency Noise, Temperature,
Current Range: 0-60 A rms	Optional AC Current

Up to seven full days worth of summary information can be stored by the 100S and reported in an easy-to-read ALL-graph format that includes the type, date and time of each disturbance recorded. It also stores the 10 worst events for each parameter measured in the events memory. Use them for quickly correlating computer failures or other events to power disturbances.

The PowerVisa 100S also will print 24-hour or seven-day-duration summary graphs of rms voltage and current, impulses (line-neutral, neutral-ground), frequency, high-frequency noise, temperature and optional current. A snapshot — or instantaneous printout — is available at any time for rms voltage. See what's happening without having to wait for a disturbance!

And now the PowerVisa can be used for current measurement. In many instances, to get a true picture of the power, you need to see both the voltage and current. By connecting the optional SmartProbe™ A-115 to your PowerVisa, you are able to measure up to a full 60 amps with 10 times the accuracy of a conventional probe. The optional SmartProbe measures from 5 to 60 amps with a 0.47" jaw capacity.

The 100S PowerVisa goes anywhere with you — in a briefcase, tool case or under your arm. It takes only seconds to connect, automatically sets thresholds (which can be altered by the user at any time) and begins monitoring.

This 5-pound unit is just 8" x 11" x 2.5", making it an ideal field-portable unit. It includes a built-in high-resolution printer, ac power cord (that is also the voltage measuring cable), two rolls of printer paper and very detailed operations guide. An optional Handbook of Power Signatures provides an even more in-depth presentation of common power disturbances. One-year factory warranty.

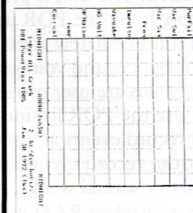
590X100	100S PowerVisa	1-2, \$2985.00 ea.; 3-up, \$2850.00 ea.
590X075	SmartProbe A-115	410.00 ea.
590X190	Canvas Carrying Case (G-401)	174.00 ea.
590X600	Repl. Paper (12 rolls) (S-401)	125.00 ea.
590X050	Handbook of Power Signatures (A-010-S)	39.95 ea.

Your PowerVisa is clearing its memory, automatically setting its thresholds, and starting to monitor.

BMI PowerVisa 100S SUMMARY

FROM: 9:38 AM Jan 30 1992 (Thu)
TO: 9:39 AM Jan 30 1992 (Thu)

1-Day All Graph



Disturbance Type	Count
Power Failure	0
Vac Swell L-N RMS	0
Vac Sag L-N RMS	0
Impulse	0
Waveshape Fault	0
Frequency	0
High Frequency Noise	0
Temperature	0
Current	0

LINE-NEUTRAL THRESHOLDS	
Vac Swell L-N RMS:	120.0 Vrms
Vac Sag L-N RMS:	105.0 Vrms
Power Failure:	84.0 Vrms
Impulse L-N:	200 Vpk
High Frequency Noise:	15.0 Vpk
High Frequency:	50.0 Hz
Low Frequency:	55.0 Hz
Waveshape Fault:	20.0 2
(min. duration 0.1 cycle)	

NEUTRAL-GROUND THRESHOLDS	
Vac Swell N-G RMS:	4.0 Vrms
Impulse N-G:	200 Vpk
TEMPERATURE THRESHOLDS	
High temperature:	+50°F
Low temperature:	+50°F

PowerVisa thresholds were last changed at: 9:38 AM on Jan 30 1992 (Thu).



Ideal Receptacle Analyzers

E-Z Check® identifies faults in three-wire, 125-V circuits without probes or meters. Fast, simple plug-in tester spots open ground, open neutral, open hot, hot on neutral, hot on open, reverse polarity plus hot and ground reversed. Bright indicators visible from any direction. Safe and convenient for hard-to-reach receptacles. Lightweight and compact pocket size. Tough impact-resistant plastic for long life. Stat-gard improves service efficiency by grounding static discharge through a proven ground. Identifies proper ground, plugs into ac receptacle and indicates if wired correctly. Test all three-wire, 120-V circuits for same faults as EZ-Check. Bright, long-life, neon lamps provide visibility from all angles. Works with most wrist straps (not included) with barfana-type connectors including all 3M models.

The E-Z Check Plus™ GFI Circuit Tester quickly and easily checks seven common wiring conditions in one operation. At the push of a button it also tests the integrity and operation of any GFI protected circuit or outlet. Use this handy, rugged push-pull tester on any three-wire, 120-V circuit. The E-Z Check® Plus Circuit Breaker Identifier with GFCI identifies circuit breakers or fuses without guesswork or service interruption. Plug-in transmitter lets one person test, identify and troubleshoot single-phase 120-V ac energized outlets or incandescent light fixtures. Multi-functional transmitter verifies wiring sequence and GFCI operation. Hand-held receiver identifies circuit breaker or fuse with flashing LED and audible tone.

370X435	61-035 E-Z Check	1-11, \$13.95 ea.; 12-up, \$13.25 ea.
370X438	61-038 Stat-gard	1-11, 23.95 ea.; 12-up, 22.50 ea.
61-051	E-Z Check Plus GFI Circuit Tester	
370X441	61-051 E-Z Check Plus GFI Circuit Tester	1-11, \$27.95 ea.; 12-up, \$26.25 ea.
61-052	E-Z Check Plus Circuit Breaker Identifier with GFCI	
370X442	61-052 E-Z Check Plus Circuit Breaker Identifier with GFCI	1-11, \$53.95 ea.; 12-up, \$50.75 ea.

Receptacle Analyzer Feature Comparison

	61-035	61-038	61-051	61-052
Open Ground	✓	✓	✓	✓
Open Hot	✓	✓	✓	✓
Open Neutral	✓	✓	✓	✓
Hot and Grd. Rev.	✓	✓	✓	✓
Hot on Neutral with Hot Open	✓	✓	✓	✓
ESD Ground Connection		✓		
G.F.C.I.			✓	✓
Circuit Breaker Identifiers				✓



PROBE Plus PP-100/200

Hand-Held Power Line Monitors

Use PROBE Plus Power Line Monitors for microprocessor-based equipment installation and service. Continuously monitor ac power line and display line voltage on ac level indicator. Tall, wide LEDs are easy to see and interpret. Green is for normal; yellow is for high and low. Lights flash quickly for 10 seconds while event is occurring for easy diagnosis. Plug equipment into special pass-through cord.

Power monitor picks up same power as equipment. Each CPU-controlled unit tests for line voltage conditions and holds 1-V accuracy. Measure common mode noise, spikes, high frequency noise, surges and sags. Instantly determine if outlet is wired properly.

The PP-100 is for normal 105-125 V operation. Detect impulses on Hot (20-500 V) and Neutral (1-50 V) lines. Monitor Surge, 135+ rms line voltage; High Line, 125+ V; Normal, 105-125 V; Low Line, >105 V; Sag, >95 V; Dropout, line voltage drop below 80 V for 500 ms; High Frequency Noise, riding on ac line; Hot Line of 2 V p-p, 10 kHz-10 MHz frequency; Hot/Neutral Reversed; Open Ground.

Use PP-200 for 210-250 V operation. Detect impulses on Phase 1 (20-500 V) or Phase 2 (20-500 V) lines. Measurements taken from position on sine wave. Monitor Surge, 270+ V rms line voltage; High Line, <250 V; Normal, 210-250 V; Low Line, >210 V; Sag, >190 V; Dropout, line voltage drop below 160 V rms for 8 ms; Power Failure, drop below 160 V for 500 ms; High Frequency Noise, superimposed on ac line of 2 V p-p frequency of 10 kHz-10 MHz; Phase Imbalance, Phase 2 20% < Phase 1; Open Ground.

Each 1-pound unit is 5.5" x 3.25" x 1.5". Two-year warranty.

530X100	PP-100 Probe Plus 110-Volt	1-5, \$290.00 ea.; 6-up, \$261.00 ea.
530X200	PP-200 Probe Plus 220-Volt	1-5, 310.00 ea.; 6-up, 279.00 ea.



BT-100 Break'r Trac'r™ AC Circuit Breaker Identifier

Break'r Trac'r™ is the perfect circuit breaker identifier for residential applications. It identifies the 120-volt ac circuit breaker or fuse supplying a receptacle or lighting fixture. The BT-100 is quick and easy to use in addition to being economically priced. Shutting off the power is not necessary. This two-piece device eliminates trial-and-error troubleshooting. An audible tone and LED display confirm breaker identification. Adjustable sensitivity enables pinpoint accuracy.

Specifications include: Maximum Load: 18 A (4 mS) @ 120 V ac, 200 mW max @ 120 V ac; Duty Cycle: max 4 mS every 16.6 mS continuous (24%). Powered by a 9-volt alkaline battery (not included). UL approved.

Model BT-100 consists of two units. The BT-100T Transmitter weighs 1.6 ounces; the BT-100R Receiver is 2.6 ounces. One-year warranty.

008X960	BT-100 Break'r Trac'r	1-11, \$39.50 ea.; 12-up, \$37.50 ea.
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Santronics AC Sensor/ DC Detector

The non-contact AC Sensor 3115 troubleshoots electrical circuits. It senses electromagnetic fields produced by ac voltage through insulation to prevent electrical shock. Locate defective ground, energized circuits and induced voltage. Operating voltage is 110-600 V ac. Red LED glows when voltage is present. Probe is injected-molded, high-impact non-flammable PVC with non-conductive outer surfaces. Pocket-sized tool runs on two AAA batteries.

DC Detector 3315 is an audio/visual troubleshooting tool. Operating voltage is 6-50 V dc. Buzzer and LED combination indicate voltage. The 3315 features sharp stainless steel tip, LED that never burns out and heat-resistant test lead. Pen-style fits hand comfortably.

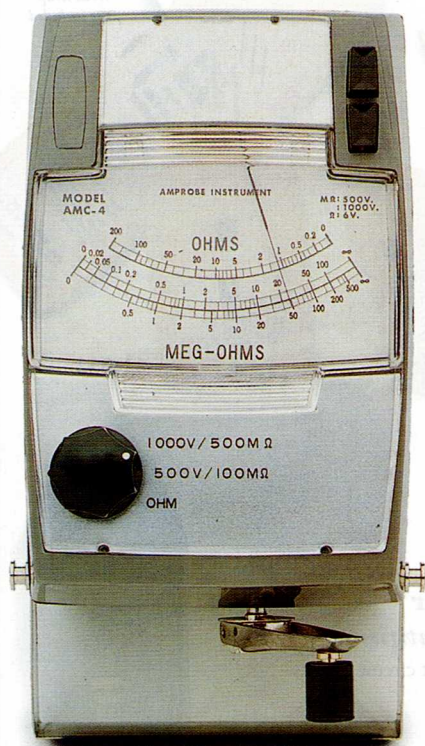
Each 40.6-gram instrument is 5.8" x .8". One-year warranty.

382X100	3115 AC Sensor	1-9, \$19.00 ea.; 10-up, \$16.50 ea.
382X315	3315 DC Detector	1-9, 22.00 ea.; 10-up, 18.75 ea.



Megohmmeters

Poor insulation can be a dangerous shock hazard to personnel as well as the cause of equipment breakdowns. Therefore, anyone responsible for installing, servicing or maintaining electrically operated equipment must be concerned about insulation resistance. To accomplish this, we offer two types of megohmmeters to suit just about any application.



Amprobe's Model AMC-4 — This top-of-the-line analog model obtains its voltage by means of a hand-cranked, constant-voltage generator. A self-contained instrument, it eliminates the need for an external power supply, making it ready to use at all times and all locations. The unit's sensitive ohmmeter range makes it especially well suited for measuring the resistance of motor windings and other low resistances.

Three ranges include 0-100 M Ω (test voltage 500 V dc), 0-500 M Ω (test voltage 1000 V dc) and 0-200 Ω (test voltage 6 V dc). Accuracy is +5% (at 500 or 1000 V dc) or

+10% (6 V dc). Unique **Guard Terminal** eliminates the effect of any surface leakage that may influence reading. It also features rugged cross-coil movements, spring-loaded terminal connections and constant-voltage generator.

Includes three-piece test lead set (two clip-type and one probe-type), dual carrying cases for instrument and leads plus comprehensive application manual. The 2.5-pound unit measures 4" x 3.7" x 7". One-year warranty.

008X008 Model AMC-4.....1-5, \$740.00 ea.; 6-up, \$703.00 ea.

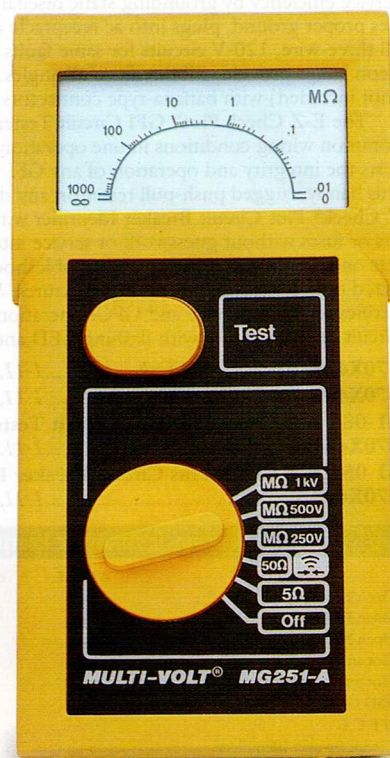


Multi-Volt's MG-251A — Use this digital, hand-held, multi-function test instrument to measure insulation resistance at test voltages of 250, 500 and 1000 volts. It also measures ac voltage, dc voltage and low resistance (continuity). Primary uses include testing power apparatus such as cables, motors, panelboards, switchgear, meters, relays and control circuits.

Model MG-251A uses the latest (LSI) CMOS technology for high reliability, stability and accuracy. But don't confuse it with a delicate instrument because all its components are shock mounted in an extra-heavy-duty case that completely protects it against accidental damage from falls, bumps or vibrations in normal use.

The modern, compact design and **autoranging** capabilities of this instrument allow for simple one-hand operation. Model MG-251A is **battery-powered** and comes with six AA batteries, two 40" long test leads with insulated alligator clips, two test probes, deluxe carrying case and detailed instruction manual. The 14-ounce unit measures 7.6" x 3.9" x 1.5". One-year warranty.

440X251 Model MG-251A.....1-5, \$899.00 ea.; 6-up, \$825.00 ea.



STACO

Variable Transformers

Allow Output Voltage from 0 to Full Line (+17%)

Staco's 1010 and 1020 Series Variable Transformers are popular industrial and laboratory models for variable ac voltage control. Two portable cord and plug styles are available with voltmeter (-V).

Series 1010 operates on 120-V input lines. Rated output is 10 A for constant current loads and 13 A for constant impedance loads. Series 1020 operates on 240-V input lines. Rated output is 3.5 A for constant current loads and 5 A for constant impedance loads.

Variable Transformers operate at 50-1500 Hz with no reduction in maximum output current but a slight reduction for 1500-2000 Hz except for the 1020 operating at constant current rating. Regulation curves at full load current show voltage drop when full load applied for brush setting. With less than full load, drop is proportional to load.

Both series have coil tapping arrangements for output voltage from 0 to line voltage or 17% above. All models can be connected to deliver increasing output voltage in clockwise or counter-clockwise rotation. All single units are supplied with three- and four-hole mounting arrangements. Each manually operated unit has a 4" diameter reversible dial graduated from 0-100 and 100-0. Rotation angle from 0 to maximum output is 320°.

Specifications for 1010: 1.2 dc resistance (Ω), 5.4 power loss at 60 Hz no load (W) and 15-35 torque (oz. in.). Specifications for 1020: 11.4 dc resistance (Ω), 5.2 power loss at 60 Hz no load (W) and 15-35 torque (oz. in.).

Choose from two three-prong cord and receptacle styles plus two metered models. Each plug-in style connected for clockwise rotation has ventilated steel case, line cord, receptacle, switch, pilot lamp and fuse. Meter versions have high-quality pivot and jewel ac voltmeter or ammeter (with 3% full scale accuracy) for easy, accurate readout. The 1010V has 0- to 150-V voltmeter or 0- to 10-A ammeter. The 1020V has 0- to 300-V voltmeter or 0- to 5-A ammeter. Each 10.25-pound unit is 10.5" x 5.6" x 5. One-year warranty.

455X120 3PN1010 120-Volt Variable Transformer.....\$183.00 ea.
455X125 3PN1010V 120-Volt Transformer with Voltmeter325.00 ea.
455X240 3PN1020 240-Volt Variable Transformer.....240.00 ea.
455X245 3PN1020V 240-Volt Transformer with Voltmeter363.00 ea.



Model 39

Power Meter

- Fast, accurate testing at a price that won't test your budget
- Handheld portability and rugged on-the-job reliability

Model 39 Power Meter is designed to meet the day-to-day needs of electricians and facilities maintenance groups. It keeps your power distribution system up and running, makes troubleshooting problems quick and easy, improves power efficiency and manages energy costs. This Fluke power meter combines rms voltage and current plus power factor of more expensive and training-intensive tools in a handheld unit. It's so easy to use, you'll be up to speed in minutes. Quickly zero in on power system problems, minimizing downtime and maximizing your system's efficiency.

This troubleshooting tool features single and three-phase power and power factor kW, PF and DPF plus apparent power with reactive power kVA and kVAR. You get harmonics to 31st, true-rms voltage and current plus K-factor. Other features include total harmonic distortion THDF and THDR plus frequency and crest factor F and CF. This meter provides waveform and spectrum displays plus phase angles of fundamental and harmonics. Modes include record (MIN, MAX and AVG) as well as zoom.

At the touch of a key, see volts, amps and watts displayed in your choice of waveforms, bar graphs and numeric values. Count on true-rms reading for accurate measurements on all types of loads. Get a real-time view of changing circuit conditions as display updates three times per second. When testing power on three-phase, three-conductor systems with balanced loads, skip manual calculations. Fluke 39 displays three-phase results from an easy single-phase measurement.

Model 39 comes complete with drip-proof and dust-proof yellow case, 500-A current clamp, ac current probe, test clips, test leads, test probes, four 48-hour alkaline C cells and new video. The 2-pound unit measures 9.2" x 3.9" x 2.5". One-year warranty.

044X039 Model 39 Power Meter1-2, \$990.00 ea.; 3-up, \$955.00 ea.



FLUKE

Model 41B

Power Harmonics Analyzer

- Advanced capabilities provide better data
- View data on PC screen with FlukeView® software

For engineers and power quality consultants who design and upgrade power distribution systems, Model 41B Power Harmonics Analyzer offers advanced capabilities that let you download test data to your PC and printer for detailed system documentation and analysis. You get the same fast, accurate test and measurement capabilities as the 39 to simplify communicating with field electricians and maintenance personnel.

But it's what you can do with all this data that makes the 41B so powerful. Zero in on harmonics, optimize power system performance, improve power quality and analyze system data to design optimal upgrades. Use FlukeView® software to view data in graphic or tabular format and generate custom reports. Transfer data to spreadsheet or word processor. Store up to eight complete data measurement sets (all screens) for future reference. Print reports, screen and tabular data directly. From taking a measurement in the field to downloading data for analysis and documentation, Fluke 41B makes capturing and working with power system data in meaningful ways easy.

Features include single and three-phase power and power factor kW, PF and DPF plus apparent power with reactive power kVA and kVAR. You get harmonics to 31st, true-rms voltage and current plus K-factor. Other features include total harmonic distortion THDF and THDR plus frequency and crest factor F and CF. The 41B provides waveform and spectrum displays plus phase angles of fundamental and harmonics. Graphical display solutions include bar graph, numeric values and volts/amps check screen. Record mode offers MIN, MAX and AVG choices.

Includes drip-proof and dust-proof case, 500-A current clamp, ac current probe, test clips, test leads, test probes, isolated RS-232 cable, FlukeView™ Software for Windows™ and DOS®, four 48-hour alkaline C cells and new video. The 2-pound unit is 9.2" x 3.9" x 2.5". One-year warranty.

044X047 Model 41B Power Analyzer ..1-2, \$1690.00 ea.; 3-up, \$1632.00 ea.



Power Meter/Harmonics Analyzer Specification Comparison

	Model 39	Model 41B
Frequency Range, Fundamental Individual	6-65 Hz and dc	
Minimum Input Levels	5 V rms or 1 A rms	
Voltage Measurements (True RMS)		
Input Range	5.0 to 600 V rms (ac+dc)	
Basic Accuracy		
rms (ac+dc)	±(0.5% + 2 digits)	
peak, dc	±(2% + 3 digits)	
Crest Factor	>3.0 below 300 V, 1.56 @ 600 V	
Amps Measurement (True rms) 1 mV/A Isolated Input		
Input Range	1.00 mV(A) to 1000 mV rms(A) (ac+dc) 1.0 mV(A) to ±2000 mV(A) peak	
Basic Accuracy		
rms (ac+dc)	±(0.5% + 3 digits) + probe specs	
peak, dc	±(2% + 4 digits) + probe specs	
Crest Factor	>3.0 below 600 mV, 2.0 @ 1000mV	
Watts Measurement (Volts-Amps) 1 mV/A Isolated Input		
Range	0 W (VA) to 600 kW (kVA) average 0 W (VA) to 2000 kW (kVA) peak	
Accuracy (ac+dc): active W (VA)	±(1%+4 digits) + probe specs, single phase	
Harmonics Measurement Accuracy		
Volts: fundamental to 13th harmonic	±(2% + 2 digits)	
Amps/Watts: fundamental to 13th harmonic	±(3% + 3 digits) + probe specs	
Phase (Fundamental)	(±2 degrees) + probe specs	
Frequency Measurement Accuracy		
Fundamental, 6.0 Hz-99.9 Hz	±0.3 Hz	
Other Measurement Features		
Input Bandwidth	dc, 6 Hz to 2.1 kHz (-0.5 dB)	
Crest Factor (CF) Range	1.00 to 5.00 (±4%)	
Power Factor (PF)	0.00 to 1.00 (±0.02%)	
Displacement Power Factor (DPF)	0.00 to 1.00 (±0.04%™ 0.30)	
Zoom Mode	Yes	No
Memory for 8 Complete Data Sets	No	Yes
Optically Isolated RS-232 interface	No	Yes
FlukeView™ PC Software	No	Yes





ST-1 SureTest® Multi-Function Circuit Analyzer

The ST-1 SureTest is the first tester to determine the current-carrying capacity of a circuit quickly, safely and reliably. It checks for proper wiring and grounding of a receptacle and for proper voltage range at the outlet. The ST-1 checks a circuit all the way back to the power source, detecting loose or corroded connections, undersized wiring and other potential problems.

This one, light, easy-to-use unit determines if a circuit can withstand additional load. It tests receptacle wiring, over and under voltage and ground fault circuit interrupters (GFCIs). SureTest automatically sequences itself through all tests in an easy-to-interpret go/no-go format. All green lights indicate no problems; any red light means further examination may be needed.

Specifications include: Voltage Level Test (accepts $\pm 10\%$ of nominal 120 V; 108 low, 120 nominal, 132 high); Current/Resistance Test (accepts $>5\%$ voltage drop); GFCI Test (applies 6 MA to ground). Built-in retractable ground pin easily tests two-pronged receptacles.

This compact unit measures 7" x 3" x 1.5" at its widest point. The nylon protective carrying case must be purchased separately. One-year warranty.

390X200.....ST-1 Std. SureTest
1-11, \$99.00 ea.
12-up, 95.00 ea.
NC-1 Nylon Carrying Case
390X150\$12.00 ea.
EC-1 12" Extension Cord
390X100.....\$8.00 ea.



ST-1 Pro Plus SureTest® Circuit Analyzer

SureTest Pro Plus is a state-of-the-art professional circuit analyzer with easy-to-read LED and go/no-go format. LCD upgrade provides increased accuracy and ease of operation to verify power outlet quality and safety. ST-1P checks a circuit all the way back to the power source, detecting loose or corroded connections, undersized wiring and other potential problems.

Quickly, safely check all outlet-related wiring conditions. ST-1P indicates NEC recommended range (FPN #210-19) for percentage of voltage drop with 15-A load applied. Indicates 108- and 132-volt acceptable range for ac line voltage (over 100).

The ST-1 Pro Plus performs false ground detection, noise detection between ground and neutral conductors plus GFCI test. Assesses quality of fault-current return path. Identifies defective conductor. Checks wiring status and polarity of outlet for proper wiring, no-ground, reversed polarity, no-hot, no-neutral or hot and ground reversal.

Hand-held ST-1P features three .3", seven-segment LEDs. An included nylon case protects and stores the 7-ounce, 7" x 3" x 1.5" GE Noryl plastic molded unit. The case also is available separately. One-year warranty.

390X225...ST-1P+ SureTest Pro Plus
1-11, \$199.00 ea.
12-up, 183.00 ea.
NC-1 Nylon Carrying Case
390X150\$12.00 ea.



ST-1D SureTest® Digital Power System Analyzer

Patented microprocessor-driven ST-1D quantifies power-outlet problems under 15-A load. With digital readout, it assesses and eliminates poor wiring and inadequate grounding systems causing equipment failures. Verify power quality, safety hazards, electrical code compliance and suitability of branch circuit to support electronic loads.

Use the ST-1D to test ac grounding parameters, current capability for unknown power branches, GFCI trip points, false grounds, ground conductor impedance, noise and peak voltage surges. TS-1D offers full-load quantitative measurements for UPS, electrical and power analysis, telco, LAN and computer industries. Operating range is 108-132 V ac at 60 Hz.

With peak-hold detector, three .3", seven-segment LEDs and leather case. The 7-ounce GE Noryl plastic unit is 7" x 3" x 1.5". Nylon case optional. One-year warranty.

390X212.....ST-1D SureTest Digital
1-5, \$295.00 ea.
6-up, 272.00 ea.
390X150 NC-1 Case.....\$12.00 ea.



ST-1THD SureTest® Wiring/Distortion Analyzer

Never before has one instrument fulfilled all your professional wiring needs: simple verification of outlet wiring, current carrying capacity and harmonic distortion measurements.

"The Engineer" performs total power quality surveys. It features true-rms readings, ground impedance, current capacity, harmonic distortion, clamp-on amps to 500, 72-hour memory storage, watt meter and power factor.

Today's electrical systems are plagued by noise and harmonic distortion from variable speed drives, switching power supplies and electronic lighting. Missing grounds, reversed polarity and overloaded branch circuits result. Solve bad wiring and dirty power problems with SureTest® THD. Self-calibrating microprocessor assures long-term accuracy and repeatability.

Includes four-digit .3" LEDs. The 7-ounce drop-proof unit is 7" x 3" x 1.5". One-year warranty.

390X232.....ST-1THD SureTest
1-5, \$489.00 ea.
6-up, 465.00 ea.
390X150 NC-1 Case.....\$12.00 ea.

SureTest Comparison				
	ST-1	ST-1P+	ST-1D	ST-1THD
Digital Readout		✓	✓	✓
True RMS		✓	✓	✓
False Ground		✓	✓	✓
15-A Current Capacity	✓	✓	✓	✓
20-A Current Capacity		✓	✓	✓
Line Frequency		✓	✓	✓
Harmonic Distortion		✓	✓	✓
V Ground to Neutral		✓	✓	✓
Load on Line		✓	✓	✓
Ground Impedance		✓	✓	✓
LED Go/No-Go A and V	✓		✓	✓



Dataman S4

Powerful, Handheld PROM Programmer/Emulator

- Offers programmability, portability and usability
- Free device library upgrades
- Memory emulator use expands your abilities

A powerful, portable, handheld programmer/emulator, Dataman S4 is just the tool to improve your engineering assignment capabilities. This device programmer's advanced internal design provides more memory, speed and device compatibility. The S4 is a versatile, intelligent and fast remotely programmable portable or stand-alone unit. It functions as a verifier, editor, emulator, code tester, program developer and target inspector.

Model S4 has a vast library of EPROMs, EEPROMs and FLASH devices up to 8 megabits. In addition to these devices, it also can program the 8751 series of microprocessors, eight-pin serial and 16-bit 40-pin PROMs using optional adaptors. Socket adaptors are available for most non-DIL packages.

The latest library of devices is already loaded when you receive your S4. Device library upgrades are free for life from Dataman. They can be downloaded at any time from high-speed bulletin boards. Loading is as easy as burning a PROM.

In stand-alone operation, 45 keys access a host of powerful functions such as SEEK, EDIT, MOVE, SPLIT and SHUFFLE with a single key-press. The FUNCTION key acts like a shift to give access to lesser-used functions such as your own personal configuration ROMs, customizing internal parameters, self-test routines and editing the internal library.

Portability is enhanced by allowing remote operation from any terminal connected to the standard RS232, DB25 socket. In fact, the S4 is completely functional with its keyboard and display removed. A free driver program makes the S4 easy to control from your PC. All functions have built-in help.

The S4 is also an inexpensive alternative to a full in-circuit emulator. Until you use it, you won't believe how convenient it is. And best of all, it can be used with any microprocessor.



Dataman S4 features surface-mounted CMOS construction. It has a light but sturdy molded plastic case with a 32-pin Textool ZIF socket, high-contrast 80-character LCD with wide viewing angle and 45 unbreakable rubber keys that are color-coded for ease of use. Inside, it uses a fast processor with 4 megabits of high-speed static RAM for data and emulation. Such standard file formats as INTEL, MOTOROLA and TEKTRONIX (and their extended variations) plus ASCII and Binary are supported for transmitting and receiving files. At a speed of 115200 baud, you can download a 64-k file in under 10 seconds.

This unit comes charged and ready to use immediately. The total package includes Emulation and Write leads, 110-V charger, ROM containing current device library (for backup) and disk (MS-DOS) with terminal software, TSR upload/download programs and other utilities plus manual. Its seven rechargeable ni-cad AA batteries retain your data and personal configuration. In the event of complete ni-cad discharge, a lithium 3-V backup battery preserves all data and device library.

The compact, lightweight and battery powered Model S4 is completely portable. Accessories are optional. Measuring just 7.3" x 4.4" x 1.8" and weighing just 18 ounces, this PROM programmer fits conveniently in your pocket or briefcase to go wherever you do. Three-year warranty.

S4-512K Dataman S4 PROM Programmer
583X721 1-2, \$795.00 ea.; 3-up, \$732.00 ea.

Dataman S4 Accessories

S4 Padded Carrying Case: Protect your S4 in this 8.5" x 2" x 6" case.

583X744 \$25.00 ea.

S4 4042 40/42-Pin Adapter: Required to program various 40- or 42-pin, eight- or 16-bit EPROMs utilizing the MROM pinout technology in a DIP package.

583X736 \$120.00 ea.

S4 SRLEE Serial EEPROM Adapter:

Required to program 24 and 93 series eight-pin Serial EEPROMs in a skinny DIP package.

583X732 \$45.00 ea.

S4 MCS51 8751 Family Micro Control Adapter: Required to program microcontrollers that make up the 8751 family in a DIP package.

583X738 \$185.00 ea.

Dataman S4 Features

To Use as a Verifier: Press two keys to verify and compare unknown device to the whole on-board library.

As an Editor: Alters and replaces code on the fly, in place.

As an Emulator: Replaces a RAM or EPROM in a circuit at full system operating.

As a Code Tester: Runs updates in programs on site to test new version code for proper machine control.

As a Program Developer: Allows trial-and-error value adjusting to machine programs and conditions.

As a Target Inspector: Inspects and alters processor operation.

Versatile: Programs serial PROMs, 8751 microprocessors plus EPROMs, EEPROMs and FLASH devices.

Intelligent: Has a complete library of EPROMs, EEPROMs and FLASH devices on board.

Current: Free lifetime library update by E-mail or disc/PROM exchange.

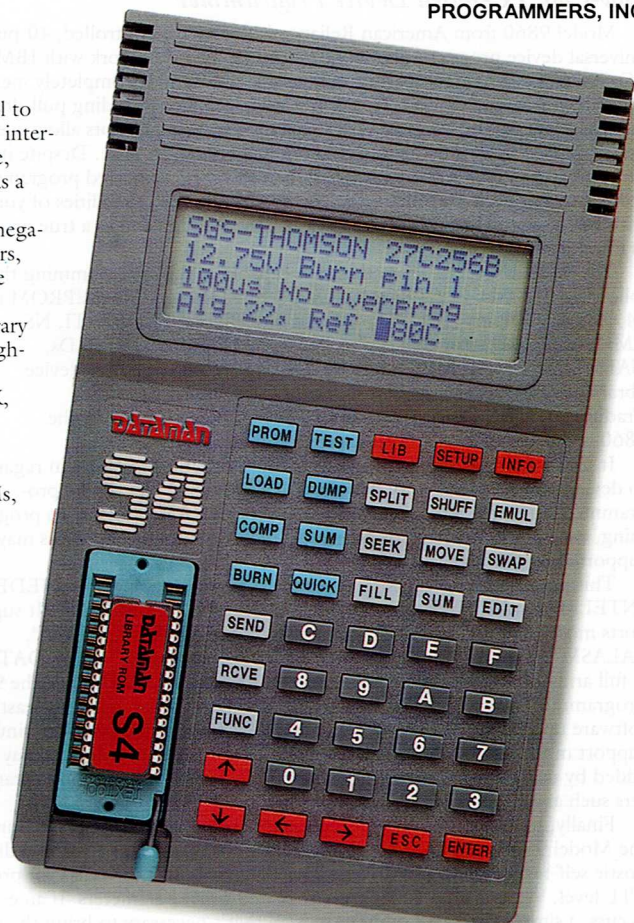
Very Fast: Uploads or downloads to computer files or devices at 115K Baud (64K file in 10 seconds).

Portable/Stand Alone: No computer required. Battery system charges in one hour, weighs less than 1.5 pounds and fits in a pocket or briefcase.

Remotely Programmable: As a programmer/editor/emulator via RS-232 and DOS software to and from any PC.

Adaptable: To 40/42-pin EPROMs; 24 and 93 series serial devices; 8751 microprocessors; PIC 16C or 17C microcontrollers; socketed SMD EPROMs; plus eight-, 16-, 24-, 28- and 32-pin DIP/DIL devices.

Compatible: With Intel, Motorola, Tektronix, ASCII and Binary file formats.



9860 Universal Programmer

Low-Cost, PC-Based Device Programmer

Model 9860 from American Reliance is a software-controlled, 40-pin universal device programming workstation. Designed to work with IBM-PC/XT/AT/386 or compatible computers, the 9860 is completely menu driven for simple operation. Its easy-to-learn interface including pull-down menus, selection and entry of boxes plus on-line help prompts allow even an inexperienced user to be up and running in a very short time. Despite its simplicity, the 9860 is more powerful than so-called dedicated programmers costing five or even 10 times more! By combining the capabilities of your PC with the powerful programming software, the 9860 becomes a true programming workstation.

The 9860 Universal Programmer is capable of fully programming the following PROMs: E(E)PROMs, CMOS EPROMs and flash EPROM of 24/28/32/40-pins (1M, 2M, 4M and up); Bipolar PROMs: TI, NS, AMD/MMI and most others plus PLDs, PALs, EPLDs, EEPLDs, GALs, IFLs, FPLAs, MPUs, etc. By utilizing a comprehensive device library of manufacturer-specific algorithms (including Standard, Traditional, Intel, Quick Pulse, Interactive and User Defined), the 9860 is capable of highly flexible programming.

It uses a full 1-Mb dynamic memory buffer that has no limit in regard to device size. Even memory devices as large as 64 M bits can be programmed with only 384 k bytes of a computer's RAM. Plus, when programming, each pin is independently driven, so a vast amount of devices may be supported by the unit.

This programmer accepts most standard file formats including JEDEC, INTEL, Extended HEX, Motorola S, Tektronix HEX and Binary. It supports most compilers in JEDEC format including ABEL™, CUPL™, PALASM®, Tango PLD™, OrCAD® PLD, PLDDesigner™ and ISDATA™. A full array of vector tests may be generated to test any PLD. Plus, the 9860 Programmer is capable of managing 16- and 32-bit word splits. At least four software updates will be issued annually to ensure that the 9860 continues to support most popular devices. Between updates, additional devices may be added by using the Device Options function to vary programming parameters such as Vpp, Vcc, Tpw, etc.

Finally, to ensure continuous high performance out of the programmer, the Model 9860 is equipped with diagnostic software that performs a diagnostic self-test of all 40-pin drivers. This diagnostic software tests for proper TTL level, Vcc and Vpp voltage, risetime and other parameters. If an error occurs, a simple hardware calibration is all that's necessary to bring the programmer back into spec.

The 9860 universal programmer consists of a desktop programming module with a 40-pin ZIF socket, a parallel interface card (that fits in a short

ARI



slot in your PC), a parallel interface cable that connects the programmer to the interface card, all necessary software and an extensive operations manual. Several special PLCC adapters are also available for programming up to 32-pin PLCCs. Contact the SPC Sales Department for specific information. One-year warranty.

System Requirements

- IBM or compatible XT, AT or '386'
- One 360K, 720K, 1.2 Mb or 1.44 Mb floppy drive
- Minimum of 384K system memory
- Any color or monochrome adapter and monitor
- Open slot (minimum of one half-length slot)

570X630 9860 Univ. Programmer1-5, \$995.00 ea.; 6-up, \$899.00 ea.

Personal E/EEPROM Programmer and Eraser

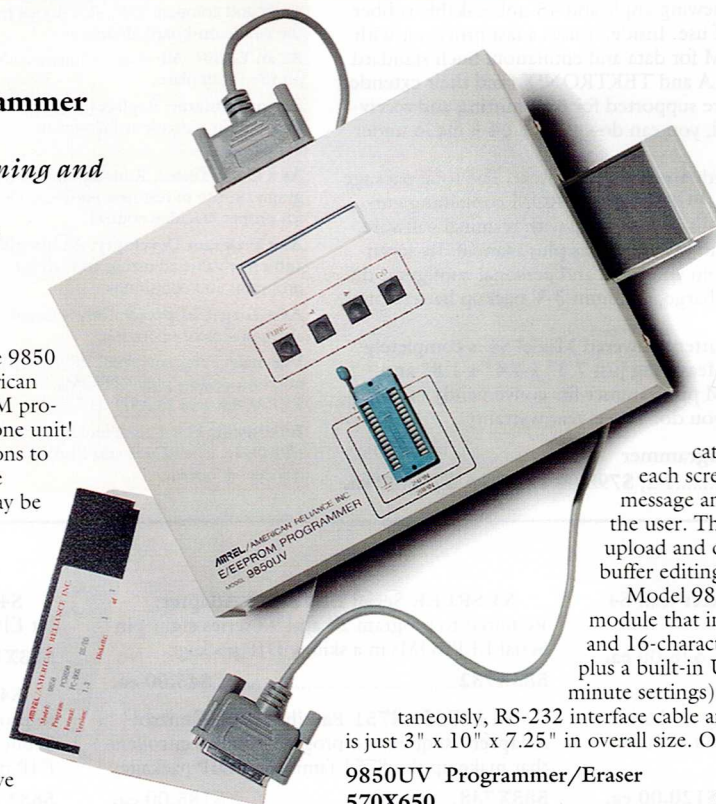
Standard E/EEPROM Programming and UV Eraser in One Unit

- Stand-alone and PC remote operation
- Programs 2716-27513 EPROMs
- Programs 2804-28256 EEPROMs
- INTEL, HEX, Binary, Motorola S and Tektronix HEX formats

This is truly an innovative product. The 9850 UV Personal Programmer/Eraser by American Reliance is both a low-volume E/EEPROM programmer and an efficient UV eraser all in one unit! It is fully featured with all necessary functions to perform programming, data editing, device checks and programming algorithms. It may be used either as a stand-alone unit or via PC remote operation.

In Stand-Alone Mode

Model 9850UV is controlled by four keys that access the six operational functions. The FUNC key selects READ, WRITE, AUTO, VERIFY, SET-UP and BLANK CHECK. Use the SCROLL keys to specify the device type or the programming algorithm. The GO key acts as the <enter> key when all parameters have been set.



As a PC Remote Unit

The 9850UV communicates with any IBM or compatible PC running the DOS operating system through an RS-232 serial interface cable that attaches to the serial port of the PC. The software allows for full communication and control of the unit. On each screen of the program, a prompted message and help utility are displayed to assist the user. The software also allows the user to upload and download files as well as access the buffer editing capabilities.

Model 9850UV comes with a programming module that includes a built-in 28-pin ZIF socket and 16-character LCD display for programming plus a built-in UV drawer (with 5-, 10- or 15-minute settings) for erasing up to six devices simultaneously, RS-232 interface cable and PC software. The 6-pound unit is just 3" x 10" x 7.25" in overall size. One-year warranty.

9850UV Programmer/Eraser

570X6501-5, \$395.00 ea.; 6-up, \$364.00 ea.

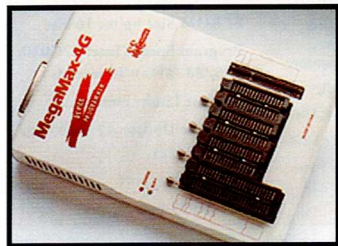


MegaMax/MegaMax-4G

Universal Device Programmer



- 48 universal pin configuration provides flexibility to program most devices from IC manufacturers
- Auto search device select function supports E(E)PROMs and flash memory
- Fast programming speed with IC vendor-approved algorithms
- Full-screen menu operates by simple keystroke commands or mouse
- Automatically configures for host parallel port (LPT1, LPT2, LPT3)
- Extensive on-line F1 help system provides text and graphics
- Multiple device programming with MegaMax-4G



MegaMax Specifications

Devices Programmed:

- PLD, EPLD, GAL, PEEL
- E(E)PROMs (8 and 16 bit)
- Flash Memory
- Microcontroller Serial

System Requirements:

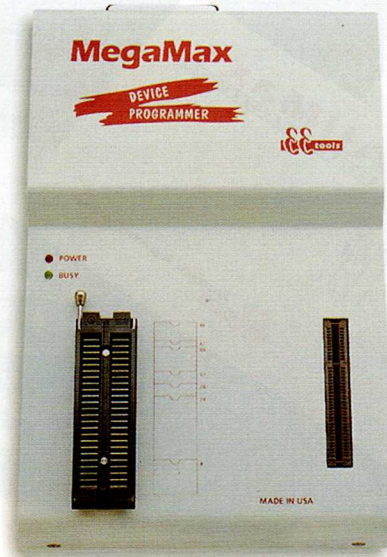
- IBM PC XT, AT, 386, 486, PS/2, Pentium, portable (laptop) or compatibles

tium, PS/2, portable (laptop) or compatibles. Superior software gives MegaMax a user-friendly advantage. Features include pull-down menus, macro capability for batch execution and virtual memory management to deal with very large files. The MegaMax can read JEDEC format output from most compilers including CUPL, PALASM, OPAL and ABEL. It includes test vector capability, a multi-array fuse map editor, DOS shell handling utilities and file format handler.

MegaMax is a cost-effective, high-quality, industrial-grade universal device programmer. It works through your PC's parallel port configured to most any desired application through software and family modules. This tool is designed for engineers, scientists and technical professionals. State-of-the-art hardware architecture with an on-board FPGA enables MegaMax to support complicated DIP-type high-density memory, PLDs and microcontrollers without adapters. The standard 48-pin Textool socket and additional family modules allow the MegaMax software to update future devices without changing the hardware circuit. Compact and enclosed, MegaMax is the perfect size for your briefcase.

The MegaMax interfaces with

IBM PC XT, AT, 386, 486, Pen-



This programmer offers many features including a built-in editor for both buffer date and test vectors. It supports JEDEC, Intel Hex, Motorola S Records, Binary and ASCII file formats with file load/save commands. It provides parallel test vector application for 20- and 24-pin PLDs. Built-in macro commands are included for production programming. Use enable/disable byte order swapping for 16-bit Motorola format. It also includes distribution of 16- and 32-bit data into 8-bit portions.

Each family module allows for the re-routing of VCC, VPP and group pins when changing to different device groups. It can be easily inserted on the SIM socket. This concept provides support for a

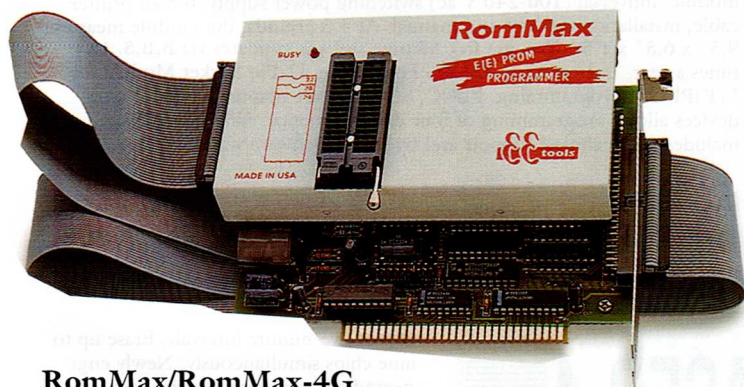
wide variety of devices with each module supporting two groups of devices.

Choose from two models. Use the MegaMax to program one device at a time. The MegaMax package contains a Textool 48-pin ZIF socket programming module, ac power transformer, 01/02 "FAMILY MODULES," 6-foot parallel printer cable, installation diskette and manual. This 4-pound unit measures 8.5" x 5" x 1.5".

MegaMax-4G has the same features as the MegaMax with an additional special provision. It programs (gangs) as many as four devices at one time concurrently. In addition, MegaMax-4G supports most popular CMOS, NMOS and HMOS EPROMs plus EEPROMs in GANG modes up to four 24, 28 and 32 pin. The MegaMax-4G package includes one Textool 48-pin and three 32-pin ZIF socket programming modules, ac power transformer, 01/02 "FAMILY MODULES," 6-foot parallel printer cable, installation diskette and manual. This 4.5-pound unit is 8.5" x 5" x 1.5".

Each model comes with lifetime free software updates via B.B.S., free technical support and one-year warranty.

725X400 MegaMax1-5, \$445.00 ea.; 6-up, \$419.00 ea.
725X425 MegaMax-4G1-5, 545.00 ea.; 6-up, 513.00 ea.



RomMax/RomMax-4G

E(E)PROM and Microcontroller Programmer

- Programs all E(E)PROMs including high-speed flash memories up to 8 mega bits
- Programs microcontrollers with adapters
- Menu-driven software with F1-help mode
- Auto search device
- Manages eight-, 16- and 32-bit data split
- Multiple device programming with RomMax-4G

RomMax is a PC-based programmer that generates fast, reliable programming with intelligent, quick pulse and flash programming algorithms. The plug-in PC board is compatible with IBM PC/XT/AT 386/486 and most clones operating on MS-DOS 2.11 or later with at least 300K RAM. It also supports Binary, Intel Hex, Motorola S and Tektronix Hex file formats. The programming module interfaces with your PC via parallel data transmission using a 40-pin ribbon cable. Self-tests include communications, pin driver tests and timing.

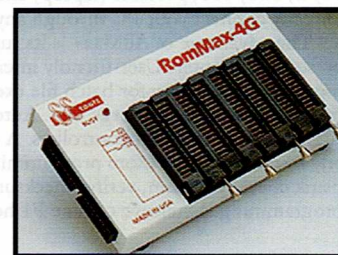
User-friendly, menu-driven software has F1-Help Mode. Software device commands include file load/save, blank-check, program, verify, read, checksum, encryption, select device, buffer edit, buffer clear, buffer fill, DOS shell and set configuration. Other software features are auto-device search, macro definition and auto-batch execution. Each programmer manages 8-, 16- and 32-bit data split.

Specifications include programming module socket (32-pin ZIF textool with 300-600 mil spacing) and interface (parallel data transmission with 5.8" x 4.3" plug-in board).

Choose from two models. The RomMax programs one device at a time. RomMax-4G has the same basic features as the RomMax along with one additional special provision. Use this parallel multiple device programmer to gang (program) as many as four devices at one time concurrently.

Includes complete software, programming module, 3-foot long 40-pin ribbon-cable and manual. Each 2-pound unit is 5.7" x 3.3" x 1.3". Free software updates via B.B.S. One-year warranty.

725X590 RomMax1-5, \$159.00 ea.; 6-up, \$150.00 ea.
725X600 RomMax-4G1-5, 219.00 ea.; 6-up, 206.00 ea.



RomMax Specifications

Devices Supported:

- NMOS/CMOS EPROMs: 2716-27C040
- EEPROMs: 2816-28010
- Page Mode EPROMs: 27C513, 27C011
- Flash E(E)PROMs: 28F256-28F020

System Requirements:

- Type: IBM PC/XT/AT/386/486 or compatibles including clones
- Hard disk drive recommended for software installation
- RAM: 300K
- OS Environment: MS-DOS 2.11 or later





AllMax+ Specifications

Universal Devices Support: PAL, EPLD, GAL, PEEL, FPLA, Bipolar PROM, E(E)PROM (8/16 bit), Flash PROM, micro-controller and Serial (E)PROM	Host Interface: Standard parallel port (LPT1, LPT2, LPT3)
Devices Tested: TTL 74/75 Series, CMOS 40/45 Series, dynamic memory, static memory	H/W Diagnostics: Support
IC Test: TTL/CMOS logic	Device AutoSelect: Support
Memory Test: DRAM/SRAM	EPROM Size up to: 16 bits
Number of Devices: Over 1800	Program Speed (Intel 27C010; 486/33 MHz): 40 seconds
Number of Socket Pins: Standard gold Textool 48-pin ZIF socket	Current Limit: Protected
	Software Update: 12 times/year (lifetime free)
	Help F1: Support
	B.B.S.: 24-hour support

AllMax+ Universal Device Programmer and Tester

Supports a Wide Range of Devices

- Tests logic IC (TTL/CMOS) and memory (DRAM/SRAM)
- Supports standard 48-pin gold ZIF socket
- Free lifetime software updates via B.B.S.

AllMax+ is a software-expandable universal device programming workstation that supports a wide range of programmable devices and tests digital ICs. It is the result of analyzing and incorporating customer feedback into the development of a cost-effective device programmer. Unique hardware/software architecture lets AllMax+ grow in support and engineering software design capabilities as quickly as your device library requirement. This state-of-the-art device offers the most advanced programming facilities with the most user friendly interface. It is one of the most reliable and durable instruments designed to meet the specific needs of engineers, scientists and technical professionals.

This multi-function unit not only programs ICs and tests TTL and CMOS logic ICs. It also tests dynamic memory and statistic memory whether ICs are defective or not. AllMax+ interfaces with IBM, PC, XT, PS/2, 386, 486, portable (laptop) and compatible personal computers. Directly connect your PC through any parallel port.

The advantage of AllMax+ is its superior software controlled via a host personal computer. User-friendly interface includes window-type pull-down menus, macro facility for batch file execution and virtual memory management to deal with very large files. Auto search device select function supports E(E)PROMs and microcontrollers. A device insertion test identifies improperly inserted device before programming. Device operations include read, blank check, program, verify, checksum, data compare, security and auto programming. Extensive on-line F1 help system provides text and graphics.

AllMax+ System Requirements

System Types: Any IBM PC/XT/AT/386/486-based compatible, PS/2, laptop or portable notebook computer
Operating System: PC-DOS, MS-DOS 2.11 or greater running at any speed
Memory: Minimum of 512K bytes of RAM memory required to program any device size; no EMS memory used for larger devices
Drives: 1.2-M floppy required; hard disk drive recommended for software installation
I/O Ports: Standard parallel port

Use auto programming for production programming. AllMax+ includes a built-in editor for both buffer date and test vectors. It can read output from most compilers in JEDEC formats such as CUPL, PALASM, OPAL and ABEL. This programmer supports JEDEC, Intel Hex, Motorola S Records, Tekhex and binary file formats with load, edit and save commands. It also features the distribution of 16- and 32-bit data into eight-bit portions.

AllMax+ hardware minimizes additional adapter usage for regular DIP-type devices. Current limiting protects hardware circuit from improperly inserted or defective chips and operation errors. A 48-pin ZIF socket accepts both 300- and 600-mil DIP devices up to 48 pins. Hardware diagnostics and calibration of all 48 pins includes logic level, voltage level and ground test. Three groups of programmable D/A voltage sources are included. The unit provides programming and verification times with 486-33 MHz PC (27C010A-23 sec, 28F020-43 sec and 27C040-115 sec).

The AllMax+ package includes 48 gold-pin ZIF socket programming module, universal (100-240 V ac) switching power supply, 6-foot printer cable, installation diskette and manual. At 4.5 pounds, the module measures 9.5" x 6.5" x 1.5". You get free lifetime software updates via B.B.S. 12 times a year. Use optional AM-4G Four-Gang 32-Pin Socket Module for E(E)PROM programming. PLCC, SOIC socket adapter for SMD-type devices allows programming of four devices at once. AllMax+ package includes free technical support and two-year hardware warranty.

725X103 AllMax+ Programmer.....1-5, \$745.00 ea.; 6-up, \$699.00 ea.
 725X140 AM-4G Four-Gang 32-Pin Socket Module.....150.00 ea.

Erasers

A. DATA II-ACT UV Eraser with Timer: The ultimate personal UV eraser is shirt-pocket size with auto start. Erases most EPROMs/ EPLDs in three minutes. Handles all sizes up to four at a time. Includes regulated lamp output for uniform erase time, ac with internal 2-8 minute timer and time-out beeper in a molded plastic case

DATA II-ACT UV Eraser
 725X200.....\$49.00 ea.

B. LA6T-110 EPROM Eraser with Timer: This personal user lamp is specially designed for small system users and computer hobbyists. It is fast and efficient. The lamp has a typical peak irradiance of 7 mW/cm², providing complete chip erasure in under 15 minutes. Maximum chip loading capacity is nine of 28-pin or six of 40-pin EPROMs. Built-in presettable automatic electronic timer has LED time interval indicator. Press a single button to set the time from 40 to 15 min-



utes at five-minute intervals. Erase up to nine chips simultaneously. Newly engineered chip drawer and vent holes prevent hazardous UV exposure to user. Conductive foam pad placed inside chip drawer prevents EPROMs from electrostatic damage. Features long UV tube life and high-intensity UV at chip surface. Plastic casing's advanced design is double insulated.

LA6T-110 EPROM Eraser
 725X350.....\$85.00 ea.

C. ERAT8Z-000 Deluxe 25-EPROM UV Eraser with Timer: For production or engineering applications. Convenient pull-out tray with antistatic conductive foam stores over a dozen devices. Capacity is 28-pin DIP 25 and 32-pin PLCC 66 pcbs. Average erase time varies between 10 and 30 minutes according to chip type.

730X190 ERAT8Z-000 Deluxe EPROM Eraser.....\$164.50 ea.



Tek LumaColor™ Photometers

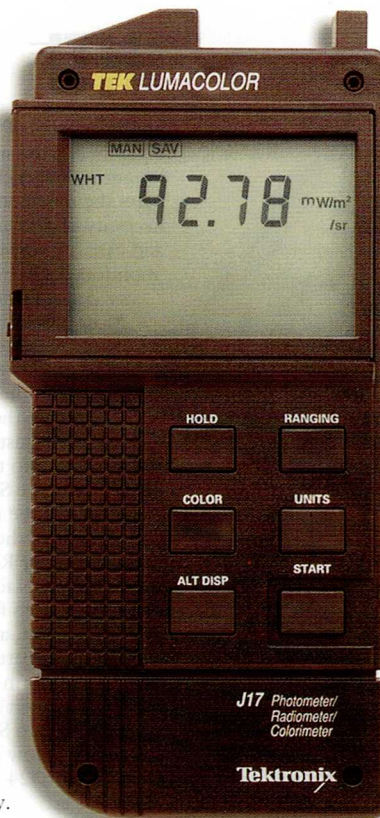
TekTools™ Integrated Light Measurement Systems

- Adaptable to many light measurement needs
- Interchangeable pre-calibrated heads
- Accurate spectral and cosine corrections
- Metric/English conversions

Tek LumaColor™ Photometers take quick, accurate light measurements in almost any environment. Rugged, handheld units with interchangeable heads provide portability with automated features. Tektronix J17 and J18 are digital photometers/radiometers/colorimeters for laboratory, field or production areas. Each consists of a handheld meter and one of eight interchangeable heads. The microprocessor performs several functions: metric-to-U.S. conversion, auto-range, auto-zero, hold and conversion between color coordinate systems. Use photometer with a PC for automated testing and data recording. The large backlit LCD can be read easily in dark locations.

Pre-calibrated plug-in heads provide measurement flexibility. Measure illuminance, irradiance, luminance, radiance, LED output and color using CIE coordinates (u' , v' or xy). All heads use silicon photodiodes and spectrally-corrected, multi-element, glass filters for long-term stability and accuracy. Connection of a head to the meter automatically selects correct measurement units.

Choose from two rugged models with 9-volt battery and manual. Each 3-pound unit is 7.8" x 3.7" x 1.3" without sensor. Requires one or more of the seven sensor heads that must be purchased separately. One-year warranty.



Tektronix

J1803 8° Luminance Head: Use this head for measuring luminance of video and projection screens plus surface reflectance. Includes suction cup, retainer/filter holder, light occluder, spectral curve and operator's manual.

220X373 J1803 Luminance Head.....\$595.00 ea.

J1805 LED Head: Measures luminous intensity output of red, yellow, green and blue LEDs. Inserts fit common sizes but can be modified for other LED sizes or similar light sources. Includes two LED inserts, rubber retainer, spectral curve and operator's manual.

220X375 J1805 LED Head.....\$595.00 ea.

J1806 8° Radiance/Radiant Intensity Head: Verify or reset and display color balance quickly after initial color characterization with Model J1810 or J1820. Includes suction cup, spectral curve and operator's manual.

220X376 J1806 Head.....\$595.00 ea.

J1811 Illuminance Head: For highway illumination, luminaires and lamps plus workstation illumination. Cosine-corrected head's multi-element glass filter and silicon photo-diode ensure close match to CIE photopic curve for accurate measurement of spectrally differing light sources. Includes spectral curve and operator's manual.

220X381 J1811 Illuminance Head.....\$695.00 ea.

J1810/1820 Chromaticity Heads: For color monitor chromaticity and white balance plus color temperature. Measure color coordinates in 1931 CIE and 1976 CIE-UCS chromaticity systems. The J1820 works with J17 Photometer. Model J1810 also provides real-time color measurements, correlated color temperature measurements and programmable control for J18 Photometer. The J1820 contains spectral curve and operator's manual. Model J1810 also includes suction cup.

220X380 J1810 Chromaticity Head.....\$1495.00 ea.

220X390 J1820 Chromaticity Head.....\$1495.00 ea.

Model J1812 Irradiance Head: Measures irradiance in laser experiments and infrared LED testing. Its spectral response is flat $\pm 8\%$ from 450 to 950 nanometers. The response is typically down 50% at 400 and 1030 nm. Includes spectral curve and operator's manual. One-year warranty.

220X382 J1812 Irradiance Head.....\$795.00 ea.

J17 Photometer

For General Photometric and Radiometric Measurements

Use this Tek LumaColor model for general photometric and radiometric measurements. Its features include autoranging, auto zero, RS-232 interface (output only) and wide dynamic range.

220X357 J17 Photometer.....1-2, \$1095.00 ea.; 3-up, \$1052.00 ea.

J18 Photometer

For Fast Color Balancing of Monitors

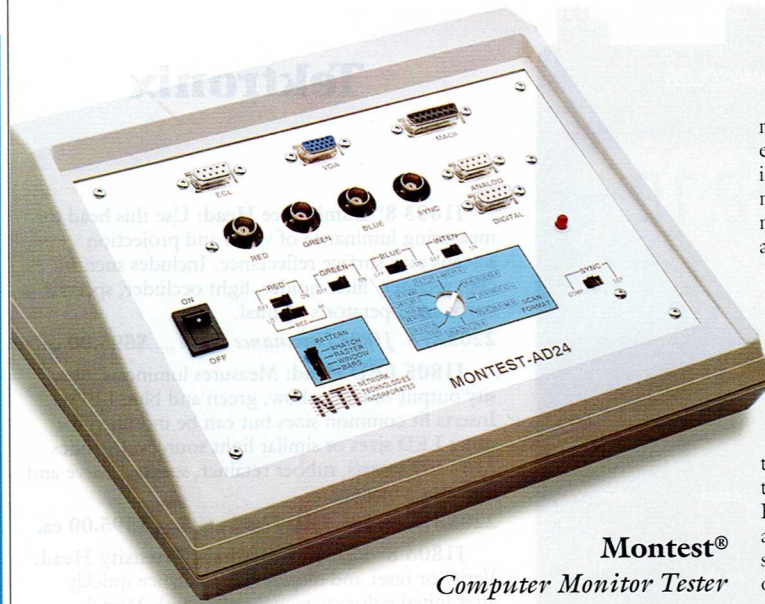
This 3.5-digit LCD photometer is ideal for fast color balancing of monitors. Features full RS-232 control, real-time color measurements, RGB bar graph, D6500 Kelvin calibration, color temperature measurement and analog output. Ten memories store reference colors (with J1810 Head). Provides full measurement control and output of results (RS-232).

220X358 J18 Photometer.....1-2, \$1995.00 ea.; 3-up, \$1915.00 ea.

J1800 Sensor Head Comparison

	J1803	J1805	J1806	J1811	J1810	J1820	J1812
Measurement	Luminance	Luminous Intensity	Radiant Intensity	Illuminance	Chromaticity Luminance	Chromaticity, Luminance	Irradiance
Applications	Displays, Television	LEDs	Displays Television	Highway Lighting, Office Lighting	Displays Television	Displays Television	Lasers, IR LEDs
Ranges with J17	0.03 to 1,500,000 candelas/m² (Nit) 0.01 to 500,000 footlamberts	0.01 mcandelas to 100 candelas	0.001 to 1,000 W/m²/sr	0.01 to 50,000 lux (lm/m²) 0.01 to 20,000 footcandles	Usable with J18 only	0.3 to 300,000 candelas/m² (Nit) 0.1 to 100,000 footlamberts	0.01 to 20,000 mW/m² 1 nW to mW
Ranges with J18	0.3 to 300,000 candelas/m² (Nit) 0.1 to 100,000 footlamberts	0.01 mcandelas to 10 candelas	0.001 to 1,000 W/m²/sr	0.01 to 5000 lux (lm/m²) 0.01 to 500 footcandles	0.3 to 1000 candelas/m² (Nit) 0.1 to 300 footlamberts	Usable with J17 only	0.01 to 2000 mW/m² 1.0 nW to 0.2 mW
Spectral Response	CIE Photopic	CIE Photopic	Flat	CIE Photopic	CIE Tristimulus	CIE Tristimulus	Flat
Spectral Accuracy	$f_1' = <3\%$ (DIN Class A)	$f_1' = <3\%$ (DIN Class A)	$\pm 8\%$ 450 to 750 nm	$f_1' = <3\%$ (DIN Class A)	$f_1' = <3\%$ (DIN Class A)	$f_1' = <3\%$ (DIN Class A)	$\pm 8\%$ 450 to 950 nm
Accuracy	5% ± 2 digits	5% ± 2 digits	5% ± 2 digits	5% ± 2 digits	0.009 at D6500	0.018 at Illum A	5% ± 2 digits
Acceptance Angle	8°	8°	8°	180° (Cosine)	16°	16°	96° (Approx.)
Other Features	Suction cup	LED adaptors	Suction cup	Level and cover	Suction cup	Suction cup	Cover





Montest® Computer Monitor Tester

Quickly and easily test, align and repair color monitors in the field! Designed as an all-in-one, comprehensive monitor tester, the Montest® greatly speeds up the time it takes to test, align and often repair color monitors in the field. Its hand-held size and economical price combine to make it a must piece of test gear for the professional responsible for troubleshooting PCs, LANs and electronic workstations. AD24, NTH's most powerful unit, is designed for testing all monitors with scan formats from 15 kHz to 89 kHz.

Because Montest can test such a wide range of monitors with just the flick of a switch, it completely eliminates the need to purchase and transport

NTH

multiple pieces of test equipment. And in most instances, it also eliminates the time-consuming necessity of disconnecting and carrying suspect monitors back to a service depot for testing.

Most monitors can now be thoroughly and quickly tested on site in the field.

To use the Montest test tester, just plug the monitor into the tester, select the SCAN FORMAT of the monitor and flip one of the color switches (either RED for on:off, GREEN for on:off and video for analog monitors, or BLUE for on:off and video for TTL monochrome monitors). Then select the desired PATTERN test, and the Montest does the rest! The Montest can perform the following patterns: 11x11 dotted cross hatch, window (with a 25% border), full uniform raster and color bars. Other features include a wide scan format (see chart), SYNC to COMP switch for place synchronization on green, SYNC to SEP switch to remove synchronization from green and hi/medium/low switch.

Model AD24 Montest measures 10" x 8" x 4" and is powered by 110 or 220 volts ac.

560X250 Montest AD24.....1-2, \$1445.00 ea.; 3-up, \$1325.00 ea.

Scan Format	Horizontal Lines	Monitor Types
15.7	240	CGA, CCTV
18.4	350	MDA
21.8	348	EGA
25.4	400	HP Vectra analog 35741
25.8	400	AT&T PC-6300
30.5G	480	PGA, graphics mode
31.5/350	350	VGA
31.5/400	400	VGA
31.5/480	480	VGA
35.0	525	Mac II (13" color)
35.2/600	600	Super VGA at 56 Hz
35.5	384	VGA — 8514 mode
35.7	400	Atari Monochrome
37.9/600	600	Super VGA at 60.3 Hz
44.9	624	E-Machines color T16 (832x624)
54.9	874	Micro-Vax
61.8	900	Sun 16" and 19" (1152x900)
63.4	1024	IBM RS6000 color 6091, 5081, HP98789A, 98754A (1280x1024)
71.7	900	Sun Grayscale 17" (1152x900)
75.1	1024	Apollo color 19" (1280x1024)

Checker 12

Computer Color Monitor Pattern Generator

- Simple operation with two front panel switches
- Bench setup of video amplifiers is a snap
- Mac mode provides sync signals in two easy ways

Checker 12 is one piece of equipment necessary for any organization supporting monitors. This hand-held, battery-operated computer color monitor pattern generator is designed for ease of use and effective operation. It fills a need in both field service and shop maintenance areas. Field service technicians can quickly isolate display problems without opening a computer. Just connect monitor to Checker 12. No more swapping video cards or monitors or tying up a computer system to test or burn in a monitor.

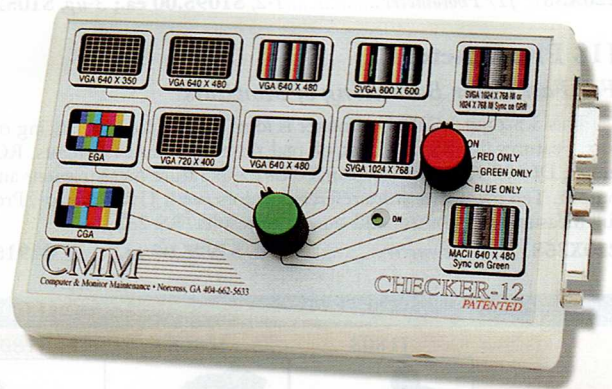
With its support of CGA, EGA, MACII, VGA modes 1,2,3, 800x600, 1024x768 int., 1024x768NI and 1024x768NI with sync on Green, you can easily check out a monitor in all of its modes. Testing monitors in the warehouse or on a storage shelf is easy. You can quickly tell if it's a VGA, SVGA or SVGA/NI without guessing. With its ease of operation, anyone can check out a monitor. Even a non-technical person can demonstrate proper monitor operation for a customer.

This device provides various test patterns for VGA monitors. Select pattern and mode with single-mode switch. Set size and position. Microprocessor is programmed to match recommended VESA standard closely for each operating mode. Unique color bar/eight-step grayscale pattern allows quick evaluation and/or setting of color balance and tracking. Not all patterns are available in every mode which actually increases ease of use. Only sweeps change in various modes, so displaying all patterns in all modes would increase the unit's complexity. Almost all settings can be achieved with CGA color bars or EGA triple color bars. Set size, centering, balance and mode switching. Cross hatch is available in all three basic VGA modes while color bars/grayscale and white screen are only in 640x480 mode.

Basic operation is controlled by two front panel switches. The Green switch is the function or mode switch while the Red one controls the power and video output. Operational sequence of the Checker 12 is non-critical. Connect monitor, select mode and turn on power in any order. Once unit is operating, switch to any mode or video output (Red, Blue or Green only). See chart for 12 basic modes of operation. Expected patterns are printed on the unit's cover. Color bars/grayscale differ slightly as you change display modes because the number or bars and/or order changes. The color bar/eight-step grayscale pattern lets you see color balance and color tracking. Bench setup of video amplifiers is a snap. Other criteria can be set using cross hatch patterns with the single turn of a switch.

Power is provided by an EN22 9-volt battery or equivalent. The .5-pound unit is 6" x 3.5" x 1.375". Ninety-day warranty.

566X012 Checker 121-5, \$295.00 ea.; 6-up, \$277.00 ea.



Checker 12 Basic Modes of Operation

Mode #	Type	Horiz. Rate	Vert. Rate	Pixels	Pattern	Notes
1	CGA	15750	60	640x200	Color Bars	Interlaced
2	EGA	22000	60	640x350	Color Bars	
3	VGA1	31500	70	640x350	X Hatch	
4	VGA2	31500	70	720x400	X Hatch	
5	VGA3	31500	60	640x480	X Hatch	
6	VGA3	31500	60	640x480	White Screen	
7	VGA3	31500	60	640x480	Color Bars/Grayscale (8 Step)	
8	VGA4	35000	56	800x600	Color Bars/Grayscale (8 Step)	
9	VGA5	35000	87	1024x768	Color Bars/Grayscale (8 Step)	Interlaced
10	VGA6	48000	60	1024x768	Color Bars/Grayscale (8 Step)	Non-Interlaced
11	VGA6	48000	60	1024x768	Color Bars/Grayscale/with Hatch Lines	Sync on Green
12	MACII	35000	67	640x480	Color Bars/Grayscale/with Hatch Lines	Sync on Green



LaserTest SX30

Laser Printer Diagnostic Tool

- Service all Canon SX engine-based laser printers
- Simplify service and reduce repair time
- Easily perform troubleshooting in the field
- No battery or external power supply needed
- Pattern generator produces six different test prints
- Operates laser printer without a computer
- Emulates laser printer control panel
- Monitors laser printer voltages

LaserTest SX30 is advancing the laser printer service industry by simplifying repair service. This low-priced, pocket-sized unit makes troubleshooting in the field quick and easy. It takes the guesswork out of printer servicing by identifying likely problem sources. This more efficient repair method lets you provide more superior service than your competition.

The laser printer is one of the most technically advanced pieces of office equipment in use today. This electromechanical device presents a frustratingly wide range of possible causes for any one problem. Its introduction necessitated the invention of a practical diagnostic method. Until now, the self-limiting pattern generator was the only option. To the delight of service personnel, LaserTest SX30 exercises the printer's engine even with major components removed. Its multifunction advancements increase production, decrease downtime and thus expand business. LaserTest SX30 can provide you with the selling edge you need in today's competitive market.

This microprocessor-controlled tool is invaluable in isolating printer problems. It is designed to help technicians eliminate possible causes for printer failure quickly while enhancing their technical skills. Although it was developed with the service industry in mind, toner cartridge suppliers and sales personnel also are benefitting from the many features this powerful defect analyzer has to offer.

The attractive LaserTest SX30 is three testers in one compact, lightweight package. Use it to emulate the display panel for a laser printer that uses only LED indicators (Apple II NT, NTX, etc.), to emulate all LCD control displays (Hewlett Packard LaserJet Series II, III, IID, IIID, etc.) and as a diagnostic tester.

With LaserTest SX30, you can operate the laser printer at its very essence. Now you can disconnect the printer from the computer, remove all the covers, toner cartridge and paper trays, have the top open, even remove the system board — and LaserTest SX30 will still be able to operate the printer! This allows technicians to monitor problems during printing, pinpoint board failures and power supply problems as well as distinguish between toner cartridge and printer problems.

The diagnostic process can now be performed more intelligently. Technicians will no longer need to change parts blindly until they accidentally discover the problem. LaserTest SX30 provides a more efficient repair method. Its advanced features let you reduce the number of possible causes of laser printer failure quickly and accurately.

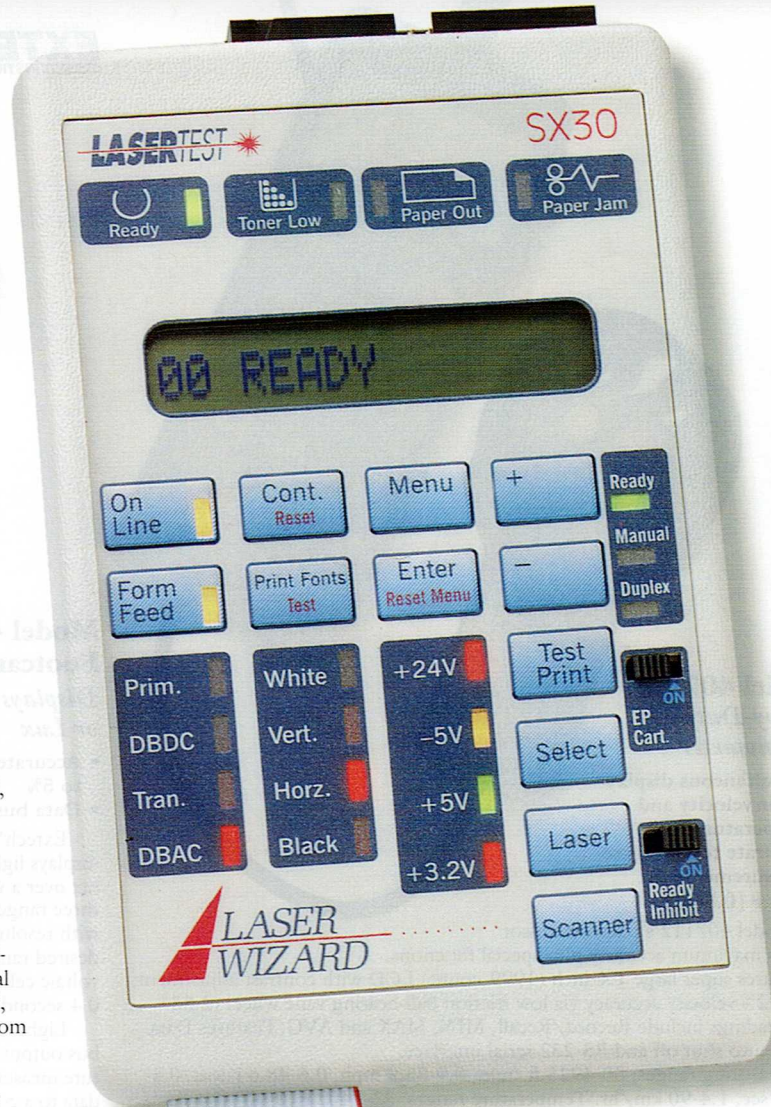
Unlike other electronic test equipment, LaserTest SX30 helps troubleshoot mechanical as well as electrical problems. If the problem is mechanical, you can view it as it happens. Various options are available if the problem involves the electronics of the printer. Quickly check to see if all voltages are present and correct. Quickly eliminate a number of possible causes through a variety of tests. You can accomplish all this without a multimeter!

This tester's advantage are endless. The ability to test the printer after cleaning but before replacing the cover is a real time saver. Now you can detect and correct other problems before reassembling the unit and having to tear it down again. This feature and the test pattern generator also let you find a minor problem before it becomes a major one. Now you can replace a part that is going bad before it causes more extensive damage.

LaserTest SX30 Applications

Troubleshoot mechanical and electrical problems:

- | | |
|----------------------------------|----------------------------|
| • Scanner problems | • DC power supply |
| • Bad paper controller board | • Bad eraser lamp assembly |
| • Blurry print | • Light print |
| • Bad dc controller board | • Bad system board |
| • Check all high-voltage signals | • Bad control panel |
| • Skewed print | • Improper registration |



LaserTest SX30 is even more convenient because it does not require its own power source. It operates from the power of the laser printer it is testing. Technicians no longer need to lug around power supplies or worry about dead batteries.

Use this state-of-the-art diagnostic tool for servicing all Canon SX engine-based laser printers. It can emulate the control panel of 246 different laser printer models containing this popular engine. They range from simple LED-only type control panels (Apple II NT, NTX, etc.) to more complex alphanumeric LCD control panels (Hewlett Packard LaserJet Series II, III, IID, IIID, etc.). Troubleshooting information is just a fingertip away. Hewlett Packard non-descript error codes with explanations are listed on the back of the unit.

This ingenious new tester offers built-in expandability. Optional modules that will be available in late 1995 will further increase its capabilities by allowing the tester to troubleshoot other laser printer engines. The durably constructed unit measures 6" x 3.5" x 1" and weighs just 6 ounces. One-year warranty.

682X300 LaserTest SX30 1-5, \$295.00 ea.; 6-up, \$279.00 ea.



Model 407112**Heavy-Duty
Anemometer**

- Simultaneous display of air velocity and temperature
- Accurate temperature measurements to 1.5° F (0.8° C)

Model 407112's microprocessor assures maximum accuracy plus special functions. It features super large 1.4-inch (1999-count) LCD with contrast adjustment. Offers 2% velocity accuracy via low friction ball bearing vane wheel (2.83" D). Readings include Record/Recall, MIN, MAX and AVG. Features Data Hold, auto shut off and RS-232 serial interface.

Measuring ranges: 80-4925 ft/min, 0.9-55.9 mph, 0.6-48.6 knots, 0.4-25 m/sec, 1.4-90 km/hr. Temperature ranges: 32-140° F (0-60° C). Temperature measurements are accurate to 1.5° F (0.8° C).

This compact unit is powered by a 9-volt battery or ac adaptor. Includes heavy-duty rubber holster with stand. The 2-pound unit measures 7" x 2.9" x 1.3". One-year warranty.

160X372 407112 Anemometer.....1-5, \$229.00 ea.; 6-up, \$215.00 ea.


EXTECH
INSTRUMENTS
Model 401025**Footcandle/Lux Meter****Displays Light Level in Fc
or Lux**

- Accurate light level measurements to 5%
- Data bus output for RS-232 interface

Extech's Footcandle/Lux Meter accurately displays light level in terms of footcandles (fc) or lux over a wide range. It measures from 0 to 5-k fc in three ranges with resolution of 0.1 fc and 0 to 50-k lux with resolution of 1 lx. Easy to operate, simply turn meter on, switch to desired range and read displayed measurement. Precision selenium photo-voltaic cells provide for excellent accuracy and sampling/response time of 0.4 seconds. It also features automatic zero adjustment.

Light levels may be monitored using the built-in analog output or a data bus output to RS-232 interface. Output of 1 mV per count lets the user capture measurements on a chart recorder. With an RS-232 interface transferring data to a computer, you can use Model 401025 as a recorder, datalogger, control system, data analyzer or automatic test equipment. A 0.5-inch digital LCD shows readings to 1999 counts and indicates overrange.

The 9-ounce Model 401025 is 6.4" x 2.8" x 1.2". Includes 9-volt battery, light sensor with coil cord and instructions. One-year warranty.

160X325 401025 Fc/Lux Meter.....1-4, \$119.00 ea.; 5-up, \$109.00 ea.

EXTECH
INSTRUMENTS
Model 480822**EMF/ELF Meter**

- Improved accuracy of 2%
- Sampling time of 2.5 times per second

Measure electromagnetic radiation levels from video terminals, fans, faulty wiring, power lines, etc. with this Electromagnetic Field Meter. It provides a large 3.5-digit, .5-inch LCD of electromagnetic field (EMF) level. Includes overrange indication and sampling time of 2.5 times per second.

Specifications include: range (0.1-199.9 mG), frequency bandwidth (30-300 Hz, ELF frequency range), number of axes (single axis) and accuracy (2% at 50-60 Hz).

Model 480822 includes 9-volt battery and application notes. The 6-ounce unit measures 5.2" x 2.8" x 1". An optional pouch carrying case is 5.5" x 4.25". One-year warranty.

160X750 480822 EMF/ELF Meter.....1-11, \$89.00 ea.; 12-up, \$82.50 ea.

160X392 409992 Carrying Case.....10.00 ea.



SIMCHECK®/SIMCHECK Plus® SIMM/SIP Memory Module and Dram Tester

Sophisticated, Time-Saver Pays for Itself in a Day

- The world's most popular and versatile memory tester
- Compact instrument is easy to use with simple LCD diagnostic messages
- Tests each module to replace time-consuming trial-and-error method
- Tests standard SIMM and SIP memory modules plus individual RAM chips

SIMCHECK is a new generation of memory testers from Aristo, the developer of the world's first portable DRAM tester in 1987. This advanced memory module tester is a portable stand-alone that does not require a computer interface. It features the power of a built-in, 16-bit, high-speed processor. Use it for comprehensive tests on all standard SIMM/SIP memory modules.

In minutes, a self-running tutorial shows you how easy it is to use. Place module or chip in socket. Press F1 to start and ESC to stop. Follow menu display to set your own test procedure. Most operator errors are tolerated; incorrectly inserted chips are not damaged.

Chips are tested simultaneously. A "✓" mark indicates a good bit; an "F" signifies a defective bit or chip. External problems on the board are pinpointed for easy repair. Testing is done under actual operational temperature and all allowable voltage conditions.

Additional data includes relative values of refresh and voltage spike performance, soft error count and speed degradation during testing.

With current prices of memory modules, you can recover SIMCHECK's cost in its first day of use.

The unit's modular design lets you buy just the features you need. Plus Aristo continues to develop new adapters that snap right into the SIP socket for fast, easy operation. The 2-pound unit is 1.5" x 5" x 6.75". Includes ac adapter and owner's manual. One-year warranty.

SIMCHECK Plus is the basic unit with a 40-Bit Port for extended testing capacity in one convenient, affordable package. The adaptor is available separately, but you get a

reduced price if you order it as part of the SIMCHECK Plus rather than as an option. It tests 72-pin SIMM modules with up to 40-bit data bus and 128-M maximum capacity. Advanced, high-speed electronic circuitry provides parallel write/read operation to all 40 bits simultaneously. External switching power supply provides current to test large-size modules at high speed.

Results include size, structure, type and speed information. Includes high-quality, user-replaceable, gold-plated ZIF SIMM socket for easy module handling. One-year warranty.

445X600 I8448 SIMCHECK1-2, \$ 990.00 ea.; 3-up, \$ 895.00 ea.
445X700 I8448+ SIMCHECK Plus with 40-Bit Port1-2, 1485.00 ea.; 3-up, 1340.00 ea.
445X684 I8484 Optional 40-Bit Port Only1-2, 790.00 ea.; 3-up, 715.00 ea.

PC Communication Package: Provides a versatile link between SIMCHECK and your PC. Fully control SIMCHECK's activities with your keyboard or mouse. Full-screen menu system with on-line help simplifies setup of test parameters and test flow. Store customized setups for future use. Colorful graphics screen details test results which are automatically logged in a file. Print detailed report with single function key or click of mouse. Graphics screen includes real-time images resembling SIMCHECK's displays and switches. Windows log test data with familiar analog indicators. Simple intuitive program doesn't require valuable time to learn. Includes small serial interface module attached to SIMCHECK's expansion slot, serial cable and communication software.

445X650 I844811 PC Communication Package1-2, \$295.00 ea.; 3-up, \$265.00 ea.

Optional Adapters

Stock No.	Part No.	Name	Description	Price Ea.
445X617	I84483	PS/2 72-Pin Adapter	Tests IBM PS/2 72-pin SIMMs of 1M, 2M, 4M and 8M	\$345.00
445X610	I84481	Single-Chip Adapter X1	Tests individual DRAM chips 64Kx1, 256Kx1, 1Mx1 and 4Mx1	99.00
445X615	I84482	Single-Chip Adapter X4	Tests individual DRAM chips 64Kx4, 256Kx4 and 1Mx4	99.00
445X625	I84486	PLCC/SOJ Chip Adapter	Tests individual PLCC chips 64Kx1, 256Kx1 and 64Kx4 plus SOJ chips 1Mx1, 4Mx1, 256Kx4 and 1Mx4 in 300 and 350 mil	245.00
445X621	I84485	PS/2 30-Pin Adapter	Tests IBM PS/2 30-pin SIMMs	195.00
445X635	I84488	Bank Adapter	Simultaneously tests up to nine individual DRAM chips: 64Kx1, 256Kx1 and 4Mx1	275.00
445X640	I84489	Static RAM Tester	Identifies, tests, verifies speed of Static RAM chips for cache memory on 386 and 486 motherboards	345.00
445X645	I844810	AST Adapter	Tests AST 1M and 4M SIMMs	345.00
445X688	I8484-9	DIMM CHECK™ 168P	Tests 168-pin DIMMs (84X2 pin dual-in-line-memory-modules) with basic configurations of x64, x72 and x80 bits (40-bit port required)	295.00
445X800	I8844	SRAM/P-SRAM Module Tester	Has two removable test heads for testing standard 64-pin SIMM/ZIF SRAM modules (64Kx32, 128Kx32 and 256Kx32) plus Apple Power Book (P-SRAM) modules (4M-12M)	595.00



SIMCHECK® II

The Next Generation of Memory Testers

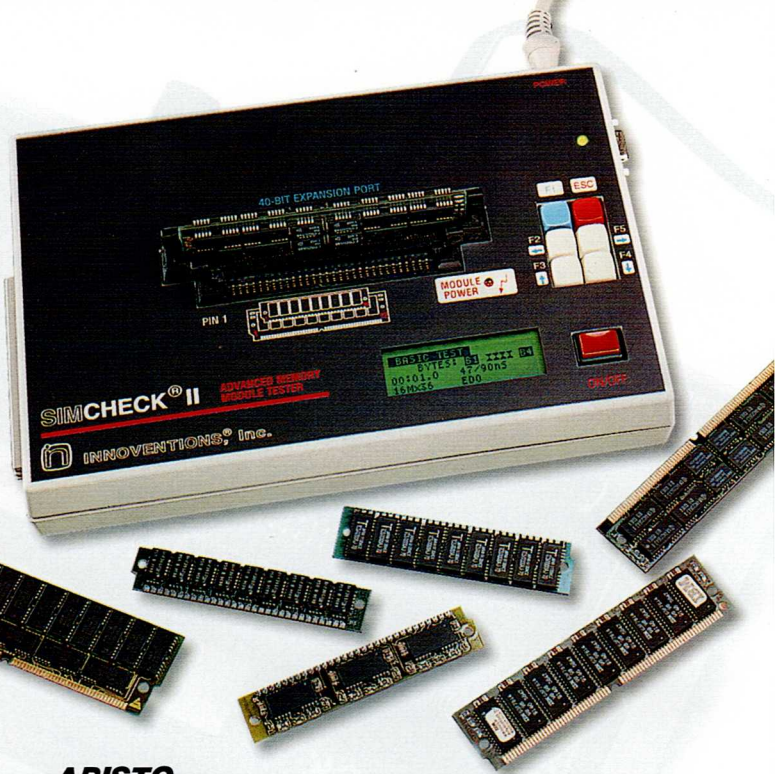
- 16-row/16-column address driving capability for up to 4Gx40 memory size testing
- RAS and CAS access time measurement at 1-nS resolution
- True cycle time measurement
- Four voltage regulators provide a full range of 2.7-volt to 5.75-volt functional tests
- Variety of advanced parameter settings

Only SIMCHECK® II can surpass SIMCHECK®, the world's first portable DRAM tester and most popular memory tester. This third-generation state-of-the-art memory tester's advanced architecture combines a fast 486 processor with sophisticated time delay circuitry. Such revolutionary technology provides the ultimate power to test today's and tomorrow's large memory devices accurately. Like its predecessor, SIMCHECK II redefines the advanced features available to you in a portable, desktop tester.

Enhanced SIMCHECK software provides the SIMCHECK II with a high-powered platform and the time-proven test capabilities on which you have come to depend. The fully automatic test program simplifies operation for non-technical personnel with the push of a single button while still allowing more advanced engineers to set up complex custom tests. It also features flash EPROMs for on-line software upgrades.

Use the patented Chip Heat Mode for high-temperature testing. SIMCHECK II also provides automatic EDO, Fast Page, Static Column and other mode analysis. The advanced setup for user-defined tests can be combined with on-the-fly parameter changes. An advanced graphic display shows clear instructions and test results. Other features include built-in PC serial interface plus built-in generic interface for automatic handler, parallel printer and other devices. The 96-pin expansion socket allows for future add-on companion testers.

At a price below large memory devices, your SIMCHECK II investment can pay for itself in less than a day. A 100- to 240-volt ac, 50/60-Hz Universal Switching Power Supply is included. Optional accessories must be ordered separately. This 4-pound memory tester measures 8.2" x 4.75" x 2.5". One-year warranty.



ARISTO Computers

- 445X725 18558 SIMCHECK II1-2, \$2490.00 ea.; 3-up, \$2245.00 ea.
- 445X686 18484-3 DRAM Card Tester245.00 ea.
- 445X688 18484-9 DIMM CHECK 168P (for 168-Pin DIMMs) ..295.00 ea.
- 445X800 18844 SRAM/P-SRAM Module Tester595.00 ea.

SIMMax

Universal Memory Module Tester

- Lightweight, portable and convenient for field use
- Up to 10 built-in tests detect and identify most memory defects
- Choose test mode/pattern, access time and device configuration
- Automatically identifies general parameters and speed of the testing SIMM

SIMMax is a stand-alone and portable field tester for computer integrators, dealers, small manufacturing companies, service professionals and qualified computer end users. Use it to test a wide variety of types of Dynamic Random Access Memory (DRAM) Single-in-Line Memory Modules (SIMM). Test the two most popular standard types: SIMM-30 (8/9 bit) and SIMM-72 (32/36 bit).

Based on high-level electronic technology, SIMMax is simple and durable in its usage. The symbol LCD and four arrow buttons form a very simple user interface. An intuitive menu system allows for easy operation. Use high-speed FPGA for test execution and built-in microcontroller to handle FPGA, programming power supply, LCD, key buttons and serial interface.



SIMMax Features

Testing Memory Types and Parameters

Page Mode and Static Column Mode types based: SIMM 72-pin, 32/36 bits; SIMM 30-pin, 8/9 bits

With:

Access Time Range: 40 to 200 ns
Timing Resolution: ± 1.5 ns
Address Depth: up to 32 MB
Data Width: up to 36 bits

Error Detection and Identification: Single data bits, power and noise related failures, solder opens and shorts, timing related failures, data retention errors, intermittent failures

User Configuration Test Modes: Walking bit 0 s, walking bit 1 s, address walking bit 0 s, address walking bit 1 s, marching up, marching down, checkerboard, inverse checkerboard, address refresh, bus noise

User Definable Testing

Configurable voltage four independent programming points
Speed Grade: 50, 60, 70, 80, 90, etc. up to 200 ns
Device Structure: up to two banks, 16 M, 36 bits
Refresh Time: 4-999 ms
Reheat Time: 1-999 s
User's Test Pattern

SIMMax provides all known general memory tests. It detects any SIMM errors such as solder opens and shorts, single data bits, timing related, data retention, etc. These tests may be preprogrammed to detect possible errors in a short time, or all tests may be executed automatically if results of the deepest evaluation of SIMM are needed. Use statistics mode for accumulated error count of tested devices. Preheat test target before starting the testing procedure to simulate real work environment. Test results may be printed out or stored to any personal computer.

This tool is extremely flexible because all important parameters are user definable. They include SIMM configuration, voltage, speed, refresh time, test pattern, etc. Automatic voltage change tests verify device performance under varying voltage conditions. This stand-alone unit is designed for future upgrades and expansion. You can upgrade SIMMax test programs easily by replacing the socketed EPROM.

Includes 30/72-pin SIMM socket testing module, ac/ac wall adapter (115/230 volts ac switchable) and manual. The 3-pound tester measures 8" x 6" x 2". Lifetime free software updates via B.B.S. Free technical support. One-year warranty.

- 725X700 SIMMax.....1-5, \$665.00 ea.; 6-up, \$625.00 ea.





Shown with 30/72-Pin Test Head

Sigma LC 32-Bit RISC Memory Test System

- Tests 16-MB module in under 60 seconds
- Complete DRAM SRAM testing
- Ability to modify RAS/CAS timings
- User programmable voltages

The Sigma LC from Darkhorse Systems is the new standard for low-cost memory test systems. This hand-held model offers the features and performance of memory testers costing thousands of dollars more. It provides the most complete set of in-depth functional testing available to determine if your memory is good or bad.

As memory size increases, having a memory tester that can keep up becomes more important. Due to its 32-bit RISC processor, the Sigma LC outperforms all the rest when it comes to pure horsepower. Perform comprehensive testing on 100% of your memory in record time at the rate of 4 seconds per megabyte. Even a novice will be amazed at how user friendly the Sigma LC is to operate. With easy-to-follow instructions provided on the tester, anyone can figure out if memory is good or bad. By merely inserting the memory into the tester, the Sigma LC will recognize what type of memory you have and at what speed it will run.

A comprehensive set of tests will determine if your memory is truly good. Pattern testing of every memory cell determines if your memory has a bad cell which indicates bad memory. Address complement of simultaneous switching determines if memory has a noise problem which means your memory has problems. Walking one and zero data field test notes if data has a short or open. A unique address bit connectivity test shows shorts or opens on address lines. Memory fresh test indicates if memory is holding its proper electrical charge. An optional pre-heat test lets you pre-heat your memory to simulate the operating speed of the part. A user-programmable voltage bump test lets you electrically test the memory's minimum and maximum voltage.

This tester offers voltage flexibility. It will support memory testing of modules with power between 3 and 6 volts. Use it with all industry standard DRAMS and SRAMS. Another feature is its ability to provide hard copy output of memory test results.

Choose from two versions. The Base Tester includes power cord, power adapter and user's guide. A high-volume docking adapter is added to the 20-003-03. *Other test heads must be purchased separately — see selection at right.* The 1.6-pound Sigma LC is 6" x 10.7" x 1.9". One-year warranty.

20-003-01 Sigma LC Base Tester

452X020 1-2, \$1590.00 ea.; 3-up, \$1499.00 ea.

20-003-03 Sigma LC Tester with 30/72-Pin SIMM Test Head Plus

452X023 1-2, \$1790.00 ea.; 3-up, \$1705.00 ea.

Sigma LC Specifications

Timing Resolution	5 ns
Timing Range	0-256 ns
Data Field	Up to 40 bits
Address Depth	512 MB
Cycle Time	10 million/sec in page mode 4 million/sec in standard mode
Memory Types	All industry standard DRAMS and SRAMS
Memory Address Modes	All static column and page modes
Memory Module Power Range	3-6 V
Error Detection and Indicators	Single data bit errors, power and noise related failures, solder open and shorts, timing related failures, data retention errors, shorts and defective devices, intermittent failures
Power Requirements	Voltage: 90-130 V ac or 180-260 V ac
Environmental Requirements	Temperature: 15-35° C Humidity: 20-80% non-condensing

Sigma LC Accessories

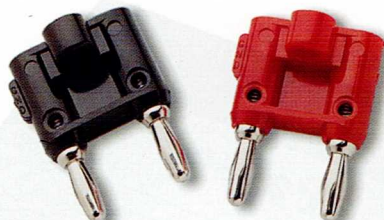
Optional software and printer accessories enhance the Sigma LC. The Software Upgrade Kit includes cable, software and four quarterly Software Updates. The BiDirectional Converter is a serial to parallel interface kit for printer hookup to the Sigma LC.

Use optional low-cost test heads to test credit card size memory and individual memory chips. If computer memory fails, test heads will help you discover which memory module is bad. The Plus models are high-volume test connectors (10,000 insertions average life expectancy). With the unique 4 Up panel test head, you can test four similar types of memory at the same time to simulate testing memory as if it were running in a PC or workstation.

452X024	20-003-04 Software Upgrade Kit.....	\$ 79.00 ea.
452X028	20-003-18 BiDirectional Converter.....	199.00 ea.
452X016	20-002-161 168-Pin DIMM Test Head.....	595.00 ea.
452X031	20-033-01 30/72-Pin SIMM Test Head.....	99.00 ea.
452X032	20-033-02 30/72-Pin SIMM Test Head Plus.....	199.00 ea.
452X044	20-033-03 4 Up 30-Pin Test Head Plus.....	349.00 ea.
452X055	20-033-06 SRAM DIP Test Head.....	199.00 ea.
452X060	20-033-07 60-Pin Test Head.....	199.00 ea.
452X068	20-033-08 68-Pin Test Head.....	199.00 ea.
452X088	20-033-09 88-Pin Test Head.....	199.00 ea.
452X100	20-033-10 Apple Test Head Kit.....	399.00 ea.
452X113	20-033-13 SOJ Test Head.....	199.00 ea.



MDP-0/MDP-2 Standard Double Banana Plugs



Nickel-plated plugs have ABS insulation. Setscrews secure leads. Plugs simplify cable construction or component mounting. They accommodate 5.5 (.215) max diameter cable. The upper end has a double banana jack that is 4.2 (.166) diameter brass. The lower double banana plug has a one-piece heat-treated

beryllium copper spring. It fits standard 4.2 (.166) diameter banana jack. Rating: 5000 V dc, 15 A, +50° C (+122° F) max.

Choose from black and red plus 10-piece kit of all colors (black, brown, red, orange, yellow, green, blue, violet, gray and white). One-year warranty.

MDP-0 Black Banana Plug

630X9621-11, \$3.00 ea.; 12-up, \$2.50 ea.

MDP-2 Red Banana Plug

630X9641-11, \$3.00 ea.; 12-up, \$2.50 ea.

MDP-KIT Banana Plug Kit

630X9701-11, \$20.50 ea.; 12-up, \$18.50 ea.

Minigrabber® Test Clip to Stacking Banana Plug

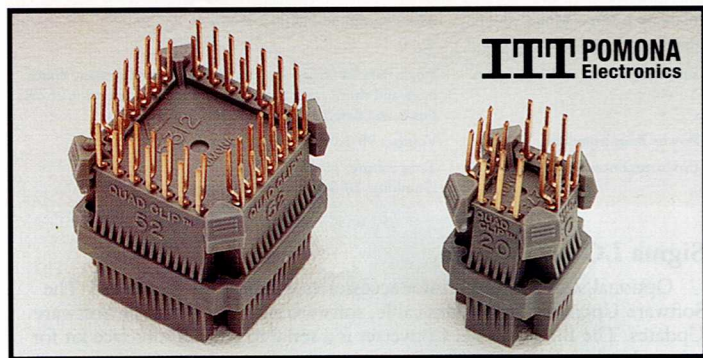
A Minigrabber® test clip on the first end features a gold-plated beryllium copper contact and glass-filled nylon insulation. The PVC-insulated wire is 20 AWG and 41 x 36 t.c. with 2.2 (.087) O.D. On the second end is a stacking banana plug with nickel-plated beryllium copper spring, brass body and polypropylene insulation. Rating: 3000 V dc, 5 A, +102° C (+216° F) max. Choose from 24" and 36" lengths in black and red. One-year warranty.

630X150 3782-24-0 24" Black Grabber1-11, \$4.50 ea.; 12-up, \$4.00 ea.

630X155 3782-24-2 24" Red Grabber1-11, 4.50 ea.; 12-up, 4.00 ea.

630X160 3782-36-0 36" Black Grabber1-11, 4.50 ea.; 12-up, 4.00 ea.

630X165 3782-36-2 36" Red Grabber1-11, 4.50 ea.; 12-up, 4.00 ea.



SMD (PLCC) Test Clips

ITT Pomona Electronics' family of Quad Clip PLCC Test Clips is the easy, economical way to test surface-mounted devices (SMDs). Each clip uses an innovative snap-ring design that firmly grips the PLCC without springs that could damage these expensive devices. A lever action is obtained simply by pushing down on the locking mechanism. Gold-plated beryllium copper contacts ensure the longest possible life and exhibit low-contact resistance. Output pins are .025-inch square gold-plated phosphor bronze on .100-inch centers. These durable test clips are compact enough to stack side by side on PLCCs as close as .375 inches apart. Choose from six popular sizes. The 5515A Kit contains all the sizes listed below plus 32 pin.

630X720 5279 (20 pin)1-11, \$ 21.50 ea.; 12-up, \$ 19.50 ea.

630X722 5280 (28 pin)1-11, 35.00 ea.; 12-up, 31.50 ea.

630X724 5281 (44 pin)1-11, 41.50 ea.; 12-up, 37.50 ea.

630X800 5312 (52 pin)1-11, 48.00 ea.; 12-up, 43.50 ea.

630X890 5401 (68 pin)1-11, 55.00 ea.; 12-up, 49.50 ea.

630X892 5402 (84 pin)1-11, 66.00 ea.; 12-up, 59.50 ea.

630X803 5515A (7-piece kit)1-5, 269.50 ea.; 6-up, 243.00 ea.

Patch Cords

Stacking Standard Banana Plug on Each End

These nickel-plated patch cords have a multiple stacking feature that accommodates the most complex stacking and keeps circuitry neater. Greatly simplify circuit connections and changes. Their reliable solder-bonded connections withstand a pull test in excess of 50 pounds.



Each end has a stacking banana plug with brass body, beryllium copper spring and polypropylene insulation. The PVC-insulated wire is 18 AWG and 65 x 36 t.c. with 3.7

(.144) O.D. Rating: 5000 V dc, 15 A, +55° C (+131° F) max.

Choose from 24" and 36" lengths in black and red plus 10-piece kits of all colors (black, brown, red, orange, yellow, green, blue, violet, gray and white). One-year warranty.

630X911 B-24-0 24" Blk. Patch Cord1-11, \$5.00 ea.; 12-up, \$4.25 ea.

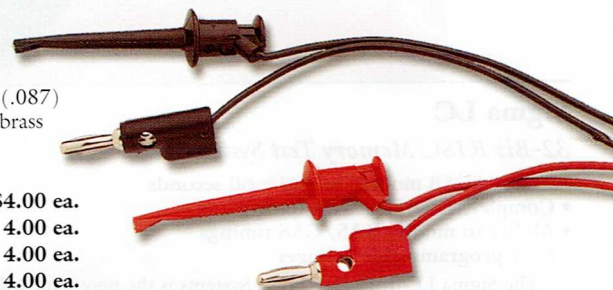
630X912 B-24-2 24" Red Patch Cord1-11, 5.00 ea.; 12-up, 4.25 ea.

630X914 B-24-KIT 24" Cord Kit1-11, 36.00 ea.; 12-up, 32.50 ea.

630X963 B-36-0 36" Blk. Patch Cord1-11, 5.00 ea.; 12-up, 4.25 ea.

630X966 B-36-2 36" Red Patch Cord1-11, 5.00 ea.; 12-up, 4.25 ea.

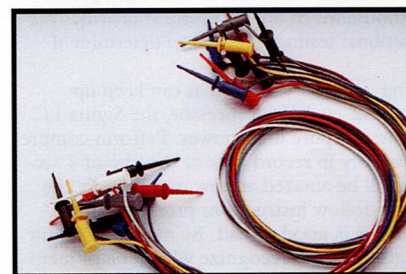
630X965 B-36-KIT 36" Cord Kit1-11, 36.00 ea.; 12-up, 32.50 ea.



SMD Grabber® to SMD Grabber Test Lead Kit

Contains 10 24-inch leads, one of each standard color.

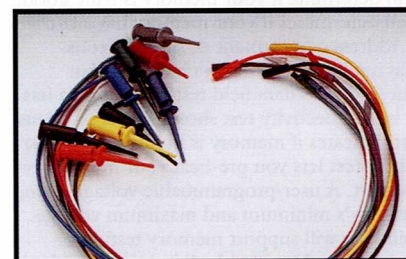
630X8065521 Kit
1-11, \$56.00 ea.
12-up, 50.50 ea.



SMD Grabber® to .025 Receptacle Lead Kit

Contains 10 12-inch leads, one of each standard color.

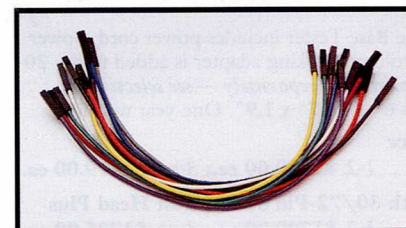
630X9855924 Kit
1-11, \$40.00 ea.
12-up, 36.00 ea.

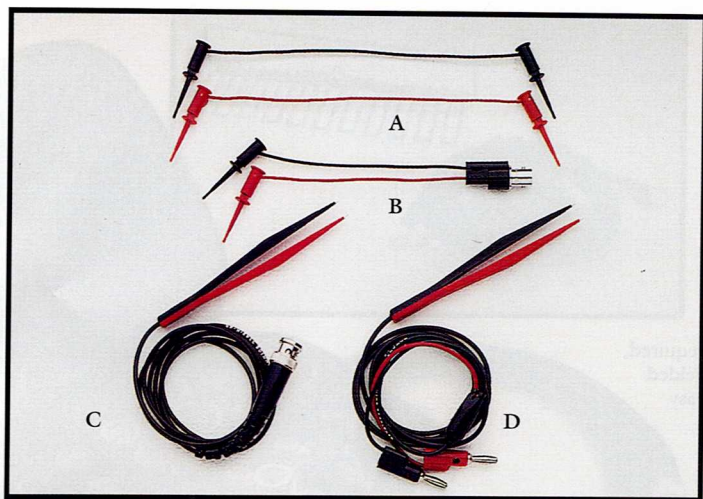


.025 Receptacle to .025 Receptacle Lead Kit

Contains 10 6-inch leads, one of each standard color.

630X9875948 Kit
1-11, \$21.00 ea.
12-up, 19.00 ea.





SMD Test Cables and Accessories

A. SMD Grabber to Grabber

Designed specifically for attaching to the small leads of SMDs, these test cables have spring-loaded, gold-plated, stainless steel test points. Wire is 22 AWG insulated PVC. Choose from three lengths (6", 12" and 24") and two colors (black and red).

Length	Stock No.	Part No.	Color	Prices	
				1-24	25-up
6"	630X740	5301-6-0	Black	\$6.90	\$6.00
	630X742	5301-6-2	Red	6.90	6.00
12"	630X746	5301-12-0	Black	6.90	6.00
	630X748	5301-12-2	Red	6.90	6.00
24"	630X752	5301-24-0	Black	6.90	6.00
	630X754	5301-24-2	Red	6.90	6.00

B. SMD Grabber to BNC Female

Designed specially for attaching to the small leads of SMDs. This cable has one end configured as a dual SMD grabber (black and red) and the other as a BNC female connector. Wire is 7" long 22-AWG insulated PVC.

630X760 5305.....1-11, \$12.75 ea.; 12-up, \$11.00 ea.

C. SMD Test Tweezer to BNC Male

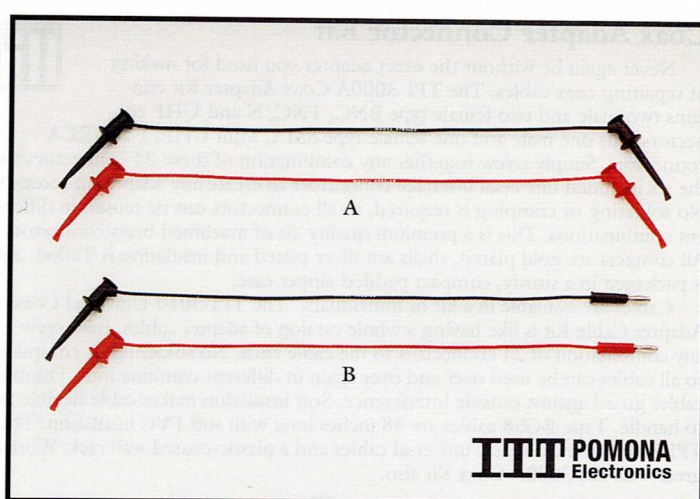
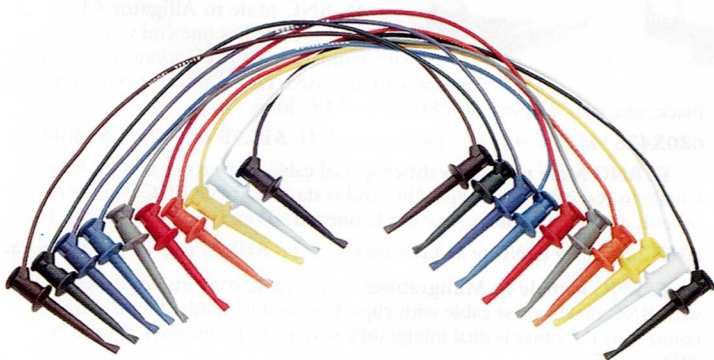
Unique tweezer clip is designed for testing surface-mount devices. One end is the SMD Test Tweezer made of gold-plated, glass-filled nylon with beryllium copper tips (to ensure a positive electrical connection). The other end is a standard BNC male connector. Wire is 48" long RG174/U shielded coaxial cable.

630X670 5142-K-48.....1-11, \$21.00 ea.; 12-up, \$18.60 ea.

D. SMD Test Tweezer to Stacking Banana Plugs

Unique tweezer clip is designed for testing surface-mount devices. One end is the SMD Test Tweezer made of gold-plated, glass-filled nylon with beryllium copper tips (to ensure a positive electrical connection). The other end is a standard dual-stacking banana plug (red and black). Wire is 48" long RG174/U shielded coaxial cable.

630X672 5143-K-48.....1-11, \$21.00 ea.; 12-up, \$18.60 ea.



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Electronics

Standard Patch Cords and Test Cables

A. Minigrabber to Minigrabber Test Cable

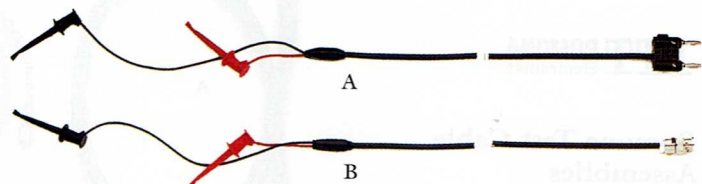
Features Minigrabber gold-plated contact hooks on either end designed for safely attaching to square wire-wrapped terminals or similar test points. Choose from three lengths (12", 24" and 48") and two colors (black and red). Wire is 20-AWG insulated PVC.

Length	Stock No.	Part No.	Color	Prices	
				1-24	25-up
12"	630X100	3781-12-0	Black	\$4.00	\$3.45
	630X102	3781-12-2	Red	4.00	3.45
24"	630X110	3781-24-0	Black	4.00	3.45
	630X112	3781-24-2	Red	4.00	3.45
48"	630X120	3781-48-0	Black	4.20	3.65
	630X122	3781-48-2	Red	4.20	3.65

B. Minigrabber to In-Line Banana Plug

Features Minigrabber gold-plated contact hook on one end designed for safely attaching to square wire-wrapped terminals or similar test points and an in-line banana plug (for attaching to most standard test equipment) on the other end. Wire is 20-AWG insulated PVC. Choose from two lengths (12" and 36") and two colors (black and red).

Length	Stock No.	Part No.	Color	1-24	25-up
12"	630X450	4650-12-0	Black	\$5.30	\$4.75
	630X452	4650-12-2	Red	5.30	4.75
36"	630X460	4650-36-0	Black	5.30	4.75
	630X462	4650-36-2	Red	5.30	4.75



A. Minigrabber to Double Banana Plug

Special test cable features two standard Minigrabber gold-plated contact hooks (red and black) on one end and a double banana plug on the other end. Cable is 36" long RG-58C/U shielded coax.

630X220 3786-C-36.....1-11, \$14.50 ea.; 12-up, \$12.90 ea.

B. Minigrabber to BNC Male

Special test cable features two standard Minigrabber gold-plated contact hooks (red and black) on one end and a standard BNC male connector on the other end. Cable is 36" long RG-58C/U shielded coax.

630X225 5187-C-36.....1-11, \$15.50 ea.; 12-up, \$14.00 ea.

Minigrabber to Minigrabber Test Cable Kits

Ideal for field service and prototyping. Minigrabber kits include one each of all 10 standard colored cables: black, brown, red, orange, yellow, green, blue, violet, gray and white. Choose from 12", 24", 48" and 60" lengths.

630X950 E 11475 (12" Cables)1-11, \$35.00 ea.; 12-up, \$31.50 ea.

630X952 5523 (24" Cables)1-11, 35.00 ea.; 12-up, 31.50 ea.

630X954 E 11477 (48" Cables)1-11, 35.00 ea.; 12-up, 31.50 ea.

630X956 E 11478 (60" Cables)1-11, 35.00 ea.; 12-up, 31.50 ea.



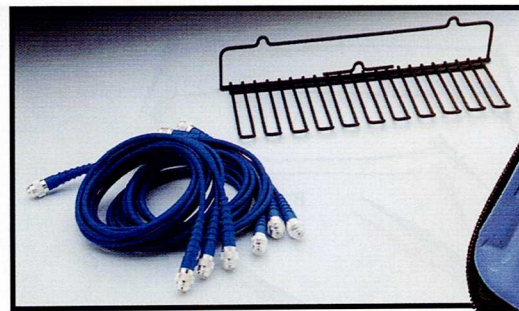
Coax Adapter Connector Kit

Never again be without the exact adapter you need for making or repairing coax cables. The TPI-3000A Coax Adapter Kit contains two male and two female type BNC, TNC, N and UHF connectors plus one male and one female type SMA, Mini UHF, F and RCA connectors. Simply screw together any combination of these 24 connectors and the six included universal interface connectors to create any adapter in seconds. No soldering or crimping is required, so all connectors can be reused in different combinations. This is a premium quality kit of machined brass connectors. All contacts are gold plated, shells are silver plated and insulation is Teflon. Kit is packaged in a sturdy, compact padded zipper case.

Cables are available in a kit or individually. The TPI-5010 Universal Coax Adapter Cable Kit is like having a whole catalog of adapter cables. Just screw any combination of 24 connectors to the cable ends. No soldering or crimping is required, so all cables can be used over and over again in different combinations. Double-shielded cables guard against outside interference. Soft insulation makes cable flexible and easy to handle. Type RG58 cables are 48 inches long with soft PVC insulation. The TPI-5010 kit includes six universal cables and a plastic-coated wall rack. Works great with the 3000A Coax Kit also.

TPI-3000A Coax Adapter Connector Kit

376X0501-5, **\$150.00 ea.**; 6-up, **\$139.00 ea.**
376X047 TPI-5010 Cable Kit1-5, **98.00 ea.**; 6-up, **92.00 ea.**
376X190 GEX48 4' Individual Cable only.....**22.00 ea.**



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Universal Adapter Kit

Field service reps, designers and lab users can quickly, easily adapt virtually any combination of coax end termination styles to another without crimping or soldering! Make your own

SMA to BNC or BNC to double banana plug adapter combinations for connection to instruments. Kit includes two male and female BNC,

TNC, SMA, N, UHF, Mini UHF, F and RCA plus six intermediate couplers, double banana plug and jack plus sampler. Durable ABS, foam-filled case. Ninety-day warranty.

Optional Universal Cables make cable assemblies from any coax adapter. Individual connections are made by threading onto coupling nuts on each end of cable for maximum flexibility.

5748 Universal Adapter Kit

630X9351-5, **\$240.00 ea.**; 6-up, **\$217.00 ea.**
630X938 5749-36 36" Universal Cable.....**\$10.00 ea.**
630X940 5749-72 72" Universal Cable.....**12.50 ea.**



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Pomona Test Cable Assemblies

A. BNC Male (Each End) cable assembly is specially designed for stress protection against failure from excess bending, flexing and twisting. Features crimped BNC male connectors with insulated PVC boot on each end plus waterproof seal between cable and connector for maximum durability. RG58C/U (50-Ω) cable comes in two sizes, 36" and 60".

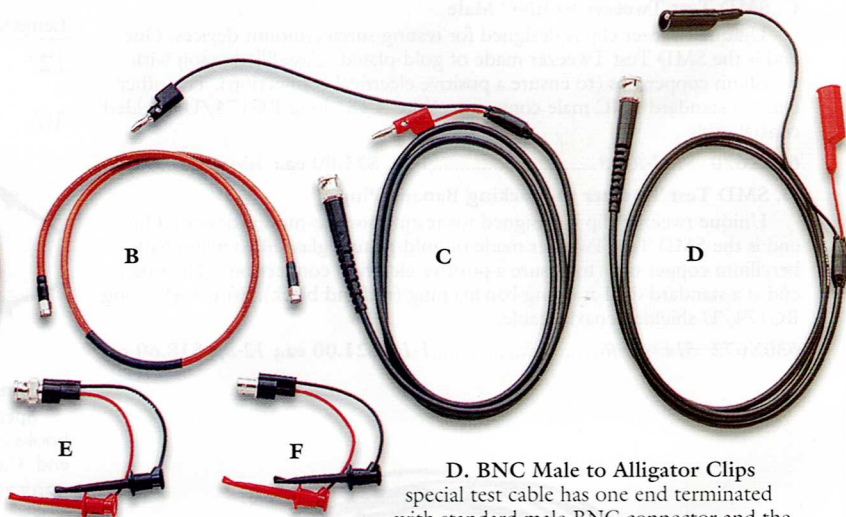
630X050 2249-C-36 (RG58-36")1-11, **\$13.00 ea.**; 12-up, **\$11.60 ea.**
630X052 2249-C-60 (RG58-60")1-11, **15.50 ea.**; 12-up, **14.00 ea.**

B. SMA Male Both Ends microwave coaxial cable assembly tests frequencies up to 12.4 Gigahertz. Terminated with male SMA-type connectors on each end. Cables are 24" long in standard RG174/U and high-frequency, high-temperature RG142B/U.

630X590 4846-K-24 (RG174-24")1-11, **\$36.00 ea.**; 12-up, **\$32.50 ea.**
630X592 4846-X-24 (RG142B-24")...1-11, **53.50 ea.**; 12-up, **48.25 ea.**

C. BNC Male to Banana Plugs special test cable has one end terminated with standard male BNC connector and the other with stacking banana plugs (one black and one red). Cable is RG58C/U and 48" long.

630X700 5268-C-48 (48" cable).....1-11, **\$18.50 ea.**; 12-up, **\$16.75 ea.**



D. BNC Male to Alligator Clips special test cable has one end terminated with standard male BNC connector and the other with insulated, plated alligator clips (one black, one red). Cable is RF58C/U and 48" long.

630X425 4531-C-48 (48" cable).....1-11, **\$15.75 ea.**; 12-up, **\$14.00 ea.**

E. BNC Male to Minigrabber special cable converts coax with BNC female to test cable with clips. One end is standard male BNC connector; the other is dual minigrabbers (one black, one red). Wire is 20 AWG and 7" long.

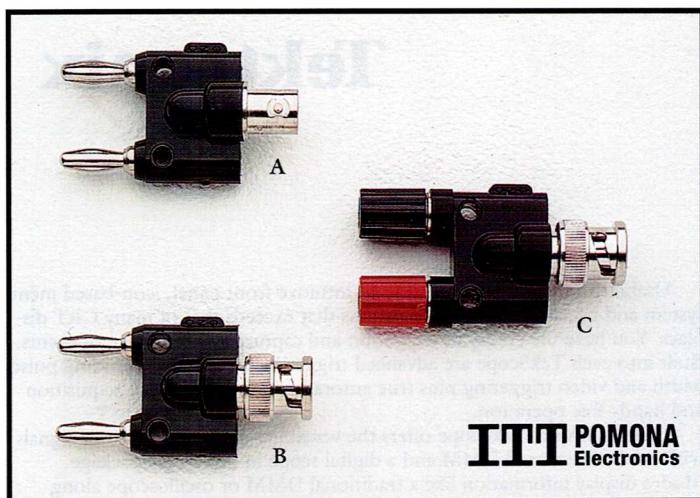
630X226 3789 (BNC to Minigrabber)1-11, **\$10.75 ea.**; 12-up, **\$9.75 ea.**

F. BNC Female to Minigrabber special cable converts coaxial cable with BNC male to test cable with clips. One end is standard female BNC connector; the other is dual minigrabbers (one black, one red). Wire is 20 AWG and 7" long.

630X219 3788 (BNC to Minigrabber)1-11, **\$8.75 ea.**; 12-up, **\$8.00 ea.**

NEXT-DAY DELIVERY
ONLY \$14.95!





BNC Adapters

Excellent for adapting laboratory VTVM, oscilloscopes and signal generator inputs to readily available coaxial cables.

A. BNC Female to Double Banana Plug permits BNC male to be with equipment having banana jacks. Cross holes in body provide side stackup connections.

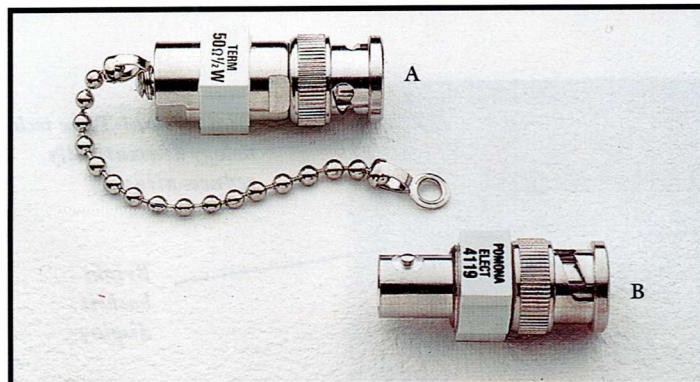
630X025 1269 Adapter1-11, \$6.65 ea.; 12-up, \$5.80 ea.

B. BNC Male to Double Banana Plug permits BNC female to be used with equipment having banana jacks. Cross holes in body provide side stackup connections.

630X026 1270 Adapter1-11, \$9.75 ea.; 12-up, \$8.75 ea.

C. Standard Double Binding Posts to BNC Male permits single or double banana plugs to be used with equipment having a BNC female.

630X029 1296 Adapter1-11, \$12.50 ea.; 12-up, \$10.80 ea.



Coaxial Accessories

A. BNC Resistor Terminated Male Plugs are ideal for terminating coaxial lines. Features a 1%, 1/2-watt deposited carbon resistor, a 3 1/2" bead chain with a .14" diameter hole in lug plus resistance value markings on the white nylon anti-roll sleeve. Shell is plated, tarnish-resistant brass with Teflon insulation and gold-plated brass center contact (to MIL-C-39012). Rated at 350 V dc (max) with a frequency range of dc to 500 MHz and a power rating of 1/2 W @ 70° C (max). Choose from three resistance values.

630X246 3840-50 (50-Ω Resistance)...1-11, \$11.00 ea.; 12-up, \$10.00 ea.

630X247 3840-75 (75-Ω Resistance)...1-11, 11.00 ea.; 12-up, 10.00 ea.

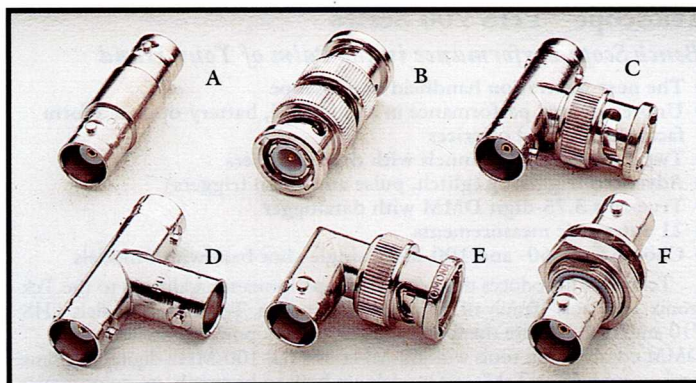
630X248 3840-93 (93-Ω Resistance)...1-11, 11.00 ea.; 12-up, 10.00 ea.

B. BNC Feed-Thru Terminations are ideal for terminating pulse, microwave or UHF instruments in their characteristic impedance. Features termination metal film resistor, deposited nichrome over ceramic core (2W) with resistance value markings on the white nylon anti-roll sleeve. Shell is plated, tarnish-resistant brass with Teflon insulation and gold-plated brass center contact (to MIL-C-39012). Rated at 500 V rms (max) with a frequency range of dc to 500 MHz at +102° C (max). Three resistance values available.

630X346 4119-50 (50-Ω Resistance)...1-11, \$47.50 ea.; 12-up, \$42.75 ea.

630X347 4119-75 (75-Ω Resistance)...1-11, 47.50 ea.; 12-up, 42.75 ea.

630X348 4119-93 (93-Ω Resistance)...1-11, 47.50 ea.; 12-up, 42.75 ea.



Coaxial Adapters

A complete selection of coaxial adapters features brass, tarnish-resistant plated bodies, Teflon insulation with a male (brass) center contact that is gold-plated to MIL-C-39012. These adapters have been rated to operate at 500 V rms (max) between -65° and +165° F with an impedance of 50 ohms (except as noted).

A. BNC Female to Female

630X060 3283 Adapter1-11, \$5.40 ea.; 12-up, \$4.57 ea.

B. BNC Male to Male

630X070 3533 Adapter1-11, \$10.00 ea.; 12-up, \$8.75 ea.

C. BNC Female to Male to Female

630X063 3285 Adapter1-11, \$14.00 ea.; 12-up, \$12.25 ea.

D. BNC Female to Female to Female

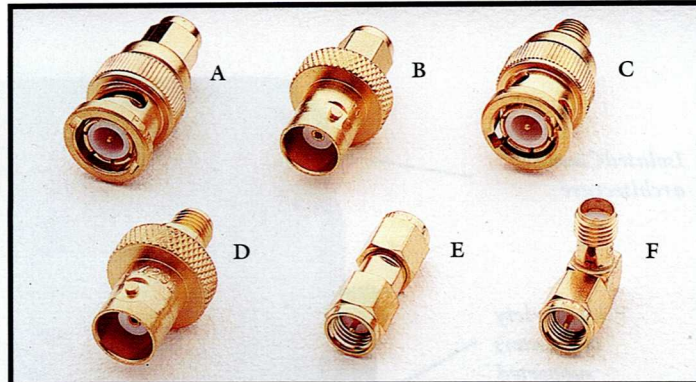
630X061 3284 Adapter1-11, \$15.65 ea.; 12-up, \$13.60 ea.

E. BNC Female to Male

630X071 3534 Adapter1-11, \$12.25 ea.; 12-up, \$10.70 ea.

F. BNC Female to Female

630X253 3846 Adapter (w/ ground)1-11, \$17.25 ea.; 12-up, \$15.00 ea.



SMA Adapters

These SMA adapters fully comply with the requirements of MIL-A-55339. The 50-ohm subminiature series R.F. connectors are especially adaptable to microwave component applications such as couplers, dividers and mixers. All adapters feature beryllium copper (SMA end) and brass (non-SMA end) construction, Teflon insulation and gold-plated brass center contacts (to MIL-C-39012). They are all rated to 335 V rms (max) with an impedance of 50 ohms.

A. SMA Male to BNC Male

630X384 4288 Adapter1-11, \$31.50 ea.; 12-up, \$28.25 ea.

B. SMA Male to BNC Female

630X386 4290 Adapter1-11, \$25.00 ea.; 12-up, \$22.50 ea.

C. SMA Female to BNC Male

630X385 4289 Adapter1-11, \$32.50 ea.; 12-up, \$29.25 ea.

D. SMA Female to BNC Female

630X387 4291 Adapter1-11, \$25.00 ea.; 12-up, \$22.50 ea.

E. SMA Male to SMA Male

630X381 4283 Adapter (M/M)1-11, \$35.00 ea.; 12-up, \$31.50 ea.

SMA Female to SMA Female (not pictured)

630X382 4284 Adapter (F/F)1-11, 35.00 ea.; 12-up, 31.50 ea.

F. SMA Female to SMA Male

630X380 4282 Adapter1-11, \$49.50 ea.; 12-up, \$44.50 ea.



TekScope™ THS 700 Series

Bench Scope Performance in the Palm of Your Hand

- The next-generation handheld oscilloscope
- Unprecedented performance in a handheld, battery-operated form factor at unheard of prices
- Two fully isolated channels with dual digitizers
- Advanced triggering (glitch, pulse and video triggers)
- True-rms 3.75-digit DMM with datalogger
- 21 automatic measurements
- Choose from 60- and 100-MHz single-shot bandwidth models

Tektronix introduces the newest high-performance additions to the Tektronix TekTools™ family of handheld instruments. TekScope™ Models THS 710 and THS 720 are the first handheld, battery-powered oscilloscope/DMM combination tools with 60-MHz or a full 100-MHz digital real time performance. Both TekScope models are built to be tough, no-compromise performers. These affordable, reliable, hard-working tools are easy to use. They cost-effectively bring Tektronix advances in higher-end oscilloscopes to the field-service industry.

Each autoranging TekScope is designed for troubleshooting electronic equipment including medical imaging technology, communications equipment and computer-controlled manufacturing equipment. Use it in field service and maintenance applications where portability is required. Due to its bandwidth and acquisition speed, it is particularly suited to capturing the high-speed signals found in today's microprocessor-based systems.

These lightweight, field-rugged units are the first digital oscilloscope/DMM combination to offer the high-speed and high-bandwidth performance needed for quick and accurate troubleshooting of a variety of electronic problems — all at an affordable price. Scope and meter modes can operate simultaneously or independently on the same or separate signals. High-resolution backlit display and pop-up menus make it easy to take full advantage of many useful features.

Unmatched troubleshooting productivity and confidence are accomplished by Tektronix's patented digital real time (DRT) oversampling technology. It dramatically reduces aliasing and enables single-shot capture at full bandwidth. This oversampling allows users to capture and compare two signals on two channels simultaneously at the instrument's full bandwidth.

Tektronix

Usability enhancements include an intuitive front panel, icon-based menu system and backlit LCD with brightness that exceeds that of many CRT displays. You have the ability to trigger on and capture a wide choice of events. Built into each TekScope are advanced triggering capabilities including pulse width and video triggering plus true autoranging for easy signal acquisition and hands-free operation.

Each Tektronix TekScope offers the versatility to measure various signals with a fully integrated DMM and a digital scope in one single package. Modes display information like a traditional DMM or oscilloscope along with 21 automatic measurements selected by the user. Store up to 10 waveforms and 10 setups in memory.

Other TekScope features include a logical and proven user interface plus digital real time technology (DRT). The icons and menus of the graphical user interface make TekScope one of the easiest handheld oscilloscopes on the market to learn and use. DRT provides accurate representations of waveforms at the full bandwidth of each instrument, even for single-shot events unlike the equivalent-time acquisition architecture used in competitive products.

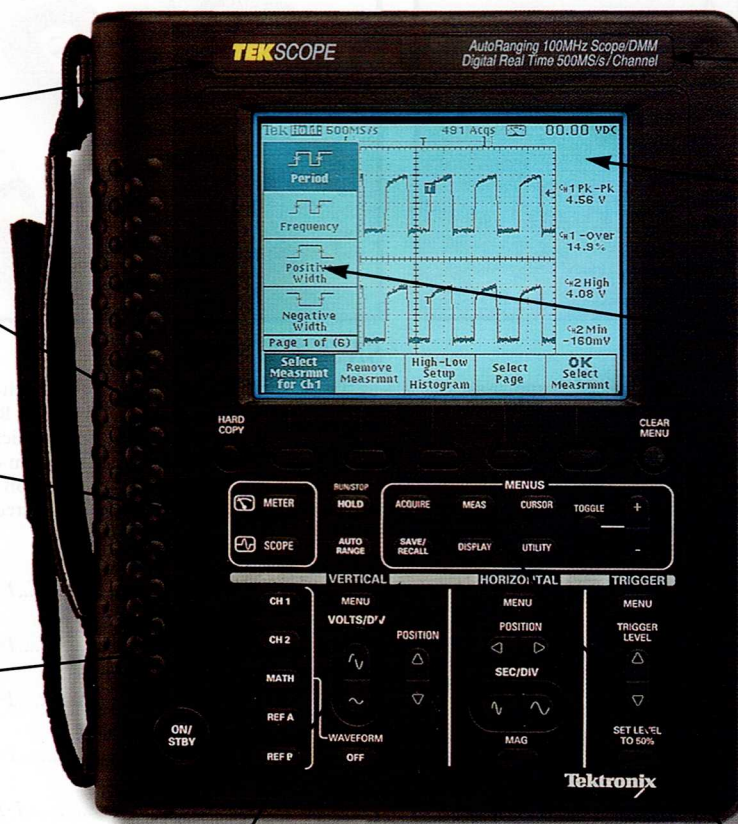
All of this capability is built into a rugged, flat-panel, small form factor for optimal portability. It is easy to set up, use and read in adverse field conditions. New technology provides white backlight with cutting-edge brightness and clarity for the LCD. This LCD maintains its full readability from dark to direct sunlight. At 320 x 240 pixels and 3.75" x 2.8", the LCD is approximately 10 times brighter than other instruments on the market. For basic voltage, current measurements and datalogging, TekScope also has an integrated 3.75-digit, 4000-count DMM with rms for increased accuracy. It is designed to withstand harsh environments without additional bulk and weight.

IsolatedChannel™ architecture

Wide variety of printers supported

True-rms autoranging DMM with data logging

Dual digitizers for full bandwidth and sample rate on both channels



Digital Real-Time technology dramatically reduces aliasing

Bright backlit display

Icon-based intuitive interface

RS-232 computer or printer interface

Advanced triggering (pulse width and video)

Ten setup and waveform memories

Twenty-one automatic measurements



You get superior safety features in the TekScope. IsolatedChannel™ architecture enables safe probing on two channels, floating independently of each other. A rating of 1000 volts root mean square (rms) with optional probes extends TekScope capabilities to high line voltage signals. Components are bundled together in a shock-proof chassis. An internal shock cushion doubles as a gasket to protect from dust, water and falls. The outer case resists chemicals and impact.

Everything needed is built in including flush-mounted tilt stand and inte-

grated, trickle-rechargeable, easy-to-change two-hour ni-cad battery. Also includes two P6113B 10X passive probes, standard meter lead set, RS-232 cable and adapters for printer and pc interface, ac power adapter, soft carrying case and user manual. Includes full ISO 9001 certification for traceability to NIST standards. UL 3111-1 listed safety certification complies with EN61010-1. Like all TekTool products, TekScopes are affordable. Choose from two models. At 8.5" x 7" x 2" and 3 pounds, each tool is smaller than most PC notebooks. Three-year warranty excludes probes.

TekScope Specification Comparison

Feature	THS 710	THS 720
Oscilloscope		
Bandwidth	60 MHz Digital Real Time	100 MHz Digital Real Time
Sample Rate	250 MS/s each channel	500 MS/s each channel
Record Length	2500 points	
Vertical	Two channels 5 mV/div to 50 V/div	
Time Bases	Main or delayed run after	
Time/Division	10 ns to 50 s/div	5 ns to 50 s/div
Display Modes	Vectors, dots, vector accumulate, dot accumulate, YT, XY	
Triggering	Main only, edge, pulse, video lines, video fields	
Acquisition Modes	Sample, average, envelope, peak detect	
Autorange	Controls volts/div, time/div, trig level and acquisition mode	
Waveform Maths	Ch1 + Ch 2, Ch1 - Ch2, Ch1 x Ch2	
Cursors	H bars, V bars, paired (volts @ time)	
Measurements	Pk-Pk, mean, min, max, rms, +width, -width, frequency, period, +duty, -duty, rise, fall	
Multimeter		
Resolution	3.75 digits, 4000 counts	
DC Volts	400 mV-880 V True RMS	
AC Volts	400 mV-640 V True RMS	
Resistance	400 Ω -40 M Ω (with continuity beeper)	
Diode Test	Up to 2 V	
Other DMM Features	Autorange, true rms, average meas., hold, statistics, Min/Max Alarm™	
General Features		
NV Storage	10 waveforms, 10 setups, 100 DMM saved screens	
User Interface	Simplified TDS 320 with pop-up menus	
I/O	RS-232 (to 38.4K baud)	
Chassis	Battery operated, hand held	
Reliability	Calculated MTBF 20,000 hours @ 25° C	

Model THS 710

60-MHz Handheld DSO/DMM

- Basic TekScope model
- 60-MHz digital real time bandwidth
- 250-MS/s per channel sample rate
- 10-ns to 50-s/div time/division range

This is the standard TekScope model. The THS 710 provides high-performance for the service professional. It combines a 60-MHz, 250-megasample-per-second oscilloscope and a true-rms DMM with datalogger. Its time/division range is 10 ns to 50 s/div.

220X981 THS 710 60-MHz Model1-2, \$1795.00 ea.; 3-up, \$1725.00 ea.

Model THS 720

100-MHz Handheld DSO/DMM

- Top-of-the-line powerful TekScope model
- 100-MHz digital real time bandwidth
- 500-MS/s per channel sample rate
- 5-ns to 50-s/div time/division range

Tektronix's top-of-the line TekScope THS 720 is packed with power. This is the answer when power, performance and portability are the service professional's requirements. Upgraded features are combined in this versatile 100-MHz, 500-MS/s oscilloscope and true-rms DMM with datalogger. Both channels digitize at a rate of 500 MS/s, 20 times the acquisition speed of previously available handheld products. Oversampling allows users to capture and compare two signals on two channels simultaneously at the instrument's full 100-MHz bandwidth. Its time/division range is 5 ns to 5 s/div.

220X983 THS 720 100-MHz Model ..1-2, \$2195.00 ea.; 3-up, \$2099.00 ea.

TekScope Accessories

Stock No.	Part No.	Description	Price
220X988	THS7HCA	TekScope Hard Carrying Case for transport applications	\$135.00 ea.
220X986	THS7CHG	TekScope External Ni-Cad Fast Battery Charger for continuous field use (ac or 12 volt)	179.00 ea.
220X985	THS7BAT	Extra TekScope Rechargeable Ni-Cad Battery Pack for continuous field use	54.00 ea.
220X512	P5102	1-kV High-Voltage 10x 199-MHz Passive Scope Probe (1000 V rms measurement, 600 V rms float)	199.00 ea.
220X825	S60DWAV	DocuWave™ publishing and archiving software for DOS and Windows	195.00 ea.
220X341	HC411	Portable Thermal Printer for hard copy output	470.00 ea.

Model 6134 Test Companion™

TekScope™ THS 700 Series Test Kit

Model 6134 Test Companion™ is a fully configured test set designed for the Tektronix TekScope™ THS 700 Series. A large durable briefcase-style Cordura carrying case with shoulder strap holds and protects the included test accessories along with your scope, tools, service books, manuals, references and miscellaneous items. The selection of quality Pomona test accessories is specifically chosen to complement your Tektronix TekScope. You get X10 150-MHz oscilloscope probes, test lead set, probe bodies with banana plug tip, flexible Grabber® test clips, grip clips, large safety alligator clips and minispring needle tips.

The rugged, lightweight case's interior features sturdy, easy-view pockets trimmed in Cordura. Grab your meter without putting the case down, or use the full-length zipper to lay it flat for full access. The 2.5-pound kit is 13.5" x 16.5" x 4.5". Accessories come with one-year warranties; the case has a 90-day warranty. *TekScope not included.*

630X999 6134 Test Kit.....1-5, \$407.00 ea.; 6-up, \$366.00 ea.



ITT POMONA
Electronics



ScopeMeter® B Test Tools

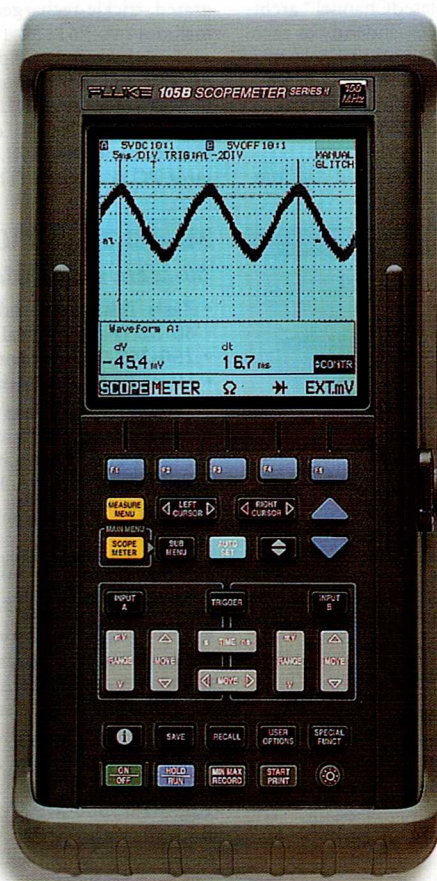
Powerful, Portable Oscilloscopes

- 10X brighter display
- Full video triggering
- Random repetitive sampling for more precision
- ScopeRecord™ with 30-k deep memory for extended waveform recording
- TrendPlot™ with time and date stamp
- Unequaled four-hour battery life

The new B version ScopeMeter® Test Tools are the brighter choice wherever you work. This updated Fluke series consists of four models with a new bright display and so much more. Advanced sampling techniques ensure excellent signal fidelity on repetitive signals over the full bandwidth. Models 105B and 99B have 100-MHz bandwidths and sampling rates up to 5 GS/s. The 96B and 92B have 60-MHz bandwidths and sampling rates up to 2.5 GS/s.

Use these rugged, handheld scopes for such on-the-go applications as avionics, audio, communications, electronics, electrical power distribution, HVAC, marine electrical troubleshooting, medical imaging, motor drives, networks, robotics and handling machinery, security and video.

This versatile family has many exciting new features in common. The new bright cold cathode fluorescent backlit LCD provides fast updates. Unparalleled brightness gives a wide viewing angle and crisp, accurate readings. Video triggering with line counter supports multiple formats (NTSC, PAL, SECAM and Hi resolution video). ScopeRecord™ (not available on 92B) for extended waveform recording can capture 30k (125 screens) to characterize complete events like long machine cycles or long pulse train activity. A time of day (real-time) clock pinpoints events. TrendPlot™ meter logging uses time of day and date stamp for easier identification of minimum, maximum and average values. This versatile electronic chart recorder marks peaks and valleys for up to 40 days.



Each full-function true-rms instrument will simultaneously take meter and scope readings with a single probe. Fully integrated DMM can measure up to four parameters simultaneously while displaying signal waveform. Measures ac,

FLUKE

ac+dc (to 5 MHz) and dc voltages in eight ranges to 600 V rms (1700 V peak to peak). Measure resistance to 30 MΩ in seven ranges. Special multimeter modes include relative, % scale, Smoothing™, Change Alert™, dBm, dBV, dBw, audio or RF watts, Hz, pulse width, TouchHold™, duty cycle and rpm.

This version uses the popular Series II interface with all the famous ScopeMeter features. It includes proper scaling of amps, watts, power, temperature, rpm, % duty cycle and pulse width. Automatic features save time and money. One-button access lets you select commonly used measurements like peak voltage, frequency and resistance. Continuous autotest ensures the best trigger, timebase and amplitude settings for the measured signal. It locks onto signal and tracks every change. Probe test point after test point without manual adjustments. Use envelope mode and gray scale to see signal changes and variations. On-line information gives immediate help on usage and hookup for all functions. Setup memories save instrument setups to avoid costly duplication of effort.

The three upgraded models feature a large nonvolatile memory to save screen images and waveforms for later analysis, comparison or PC download. FlukeView® Software lets your PC communicate with the test tool via the RS-232 serial interface. Versions for DOS and Windows support all models. (Screen capture only for Model 92B.) Print out complete screens directly or store graphical data for use in word processors or spreadsheets. Create a library of waveforms for reference and comparison.

Choose from two 100-MHz and two 60-MHz models with or without certificate of calibration. Completely portable, each works four hours per single battery charge. Includes probes, leads, battery and charger. Each 4-pound model is 2.5" x 5.5" x 10.8". Three-year warranty.

Fluke 105B ScopeMeter

100-MHz Bandwidth with 5-GS/s Max Sampling Rate

- Top-of-the-line model includes FlukeView® software
- Optically isolated RS-232 serial interface cable provided
- Hard carrying case protects portable instrument

Fluke's most fully-featured ScopeMeter B is a 100-MHz DSO with a fully integrated DMM. Model 105B's 100-MHz bandwidth and 5 GS/s sampling rate ensure excellent fidelity on repetitive signals. In addition to all the common B version features, it includes 30-k deep memory with ScopeRecord, 40 automatic measurements, 12 cursor measurements, full PC interface and waveform math.

A large non-volatile memory stores and recalls 40 individual setups for

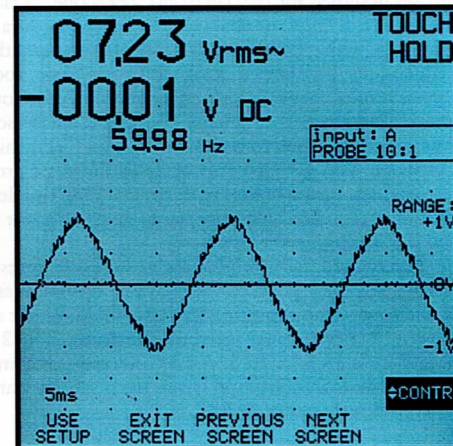
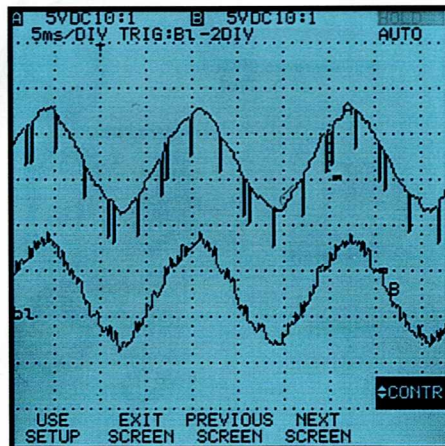
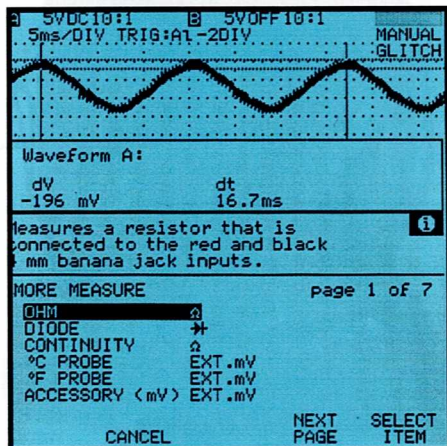
quick configuration, 20 waveforms for quick and accurate signal comparison and 10 screens for a quick snapshot of exactly how the signal looks. All 70 storage locations can be loaded to a PC with the optically isolated RS-232 serial interface and DOS or Windows FlukeView® software. Print out complete screens directly or store graphical data for use in wordprocessors or spreadsheets. Create a library of waveforms for reference and comparison. Includes software, interface cable and hard carrying case.

105B/003 Fluke 105B ScopeMeter

044X231 1-2, \$2590.00 ea.; 3-up, \$2487.00 ea.

105B with Certificate of Calibration

044X231C 1-2, \$2715.00 ea.; 3-up, \$2612.00 ea.



Fluke 99B ScopeMeter

100-MHz Bandwidth with
5-GS/s Max Sampling Rate

Model 99B includes all the B version features and more. Its 100-MHz bandwidth and 5-GS/s sampling rate ensure excellent fidelity on repetitive signals. It provides 30-k deep memory with ScopeRecord, 40 automatic measurements, 12 cursor measurements, full PC interface and waveform math. A large non-volatile memory stores and recalls 40 individual setups, 20 waveforms and 10 screen images. Interface and software are optional.

99B/003 Fluke 99B ScopeMeter

044X224.....1-2, \$2190.00 ea.; 3-up, \$2108.00 ea.

99B with Certificate of Calibration

044X224C.....1-2, \$2320.00 ea.; 3-up, \$2233.00 ea.

Fluke 96B ScopeMeter

60-MHz Bandwidth with
2.5-GS/s Max Sampling Rate

Besides the standard B version features, 96B includes 30-k deep memory with ScopeRecord, 40 automatic measurements, 12 cursor measurements and full PC interface. A large non-volatile memory stores and recalls 20 setups, 10 waveforms and five screens. The interface and software are optional.

96B/003 Fluke 96B ScopeMeter

044X211.....1-2, \$1790.00 ea.; 3-up, \$1725.00 ea.

96B with Certificate of Calibration

044X211C.....1-2, \$1920.00 ea.; 3-up, \$1850.00 ea.

Fluke 92B ScopeMeter

60-MHz Bandwidth with 2.5-GS/s Max Sampling Rate

The basic 92B includes all the standard B version features. It supplies direct access to 28 automatic measurements. Provides screen capture only.

92B/003 Fluke 92B ScopeMeter

044X203.....1-2, \$1490.00 ea.; 3-up, \$1435.00 ea.

92B with Certificate of Calibration

044X203C.....1-2, \$1620.00 ea.; 3-up, \$1560.00 ea.



ScopeMeter B Accessories

RS-232 Serial Interface Cable: Optically isolated interface cable provides full remote control operation. Send measurements to a computer for storage or detailed analysis, download complex setups from a PC and send measurements directly to a printer. Includes 3.5" PC diskette. Interface is included with 105B; optional for 99B and 96B.

044X905 PM-9080/001 Interface.....\$145.00 ea.

FlukeView® Software: Runs on a PC and communicates with the test tool via RS-232 serial interface. Upload and download screens, setups and waveforms to a DOS-based or Windows PC. Software is included with 105B; optional for 99B and 96B.

044X970 SW90D/001E DOS Version.....\$195.00 ea.

044X971 SW90W/011E Windows.....\$195.00 ea.

Fast Battery Charger: Recharge internal ni-cad batteries in three hours with 115-V ac charger.

044X880 PM-8906/003 Charger.....\$165.00 ea.

ScopeMeter B Series Applications

Avionics: Rugged, portable design is perfect for flight line use. Long, four-hour battery life lets you work far away from outlets.

Audio: Built-in 976-Hz square wave is a great signal injector. Measure audio watts directly to eliminate charts and tables.

Communications: External TTL trigger input allows data capture on two voltage channels while triggering on the third. X vs. Y mode with user-selectable persistence facilitates constellation testing.

Electrical Power Distribution: UL listed and IEC 1010 compliant for CAT III, 600-V measurements on industrial electrical distribution. Integrated true-rms DMM ensures accurate measurements on "imperfect" power lines. FlukeView software provides spectrum analysis of captured waveforms for diagnosing harmonic problems. TrendPlot documents and time stamps dropouts.

HVAC: Use ScopeRecord for long machine cycles while maintaining fine time resolution. UL listed and IEC 1010 compliant for CAT III, 600-V measurements on industrial electrical distribution circuits. Common measurement terminal floats up to 600 V above ground. TrendPlot documents and time stamps dropouts.

Medical Imaging: Video triggering with built-in line selector simplifies checking x-ray and ultrasound monitors. LCD is less susceptible to the magnetic rigors of NMR service than CRT scopes.

Motor Drives: Current probe reads directly in amps and is an excellent trigger source for ac drive controls. UL listed and IEC 1010 compliant for CAT III, 600-V measurements on industrial electrical distribution circuits. The common measurement terminal floats up to 600 V above ground.

Networks: Random repetitive sampling gives resolution down to 200 ps. Separate trigger input provides added flexibility.

Robotics and Handling Machinery: Use ScopeRecord for long machine cycles while maintaining fine time resolution for all sequential events.

Security: Use TV triggering to troubleshoot surveillance cameras. TrendPlot and ScopeRecord help capture signals from remote sensors and indicate time of day.

Video: Video triggering supports NTSC, PAL, SECAM and Hi res standards. Observe individual video lines with built-in line counter. Four field sequence mode allows positive lock onto color burst.

Model 6120 Test Companion™

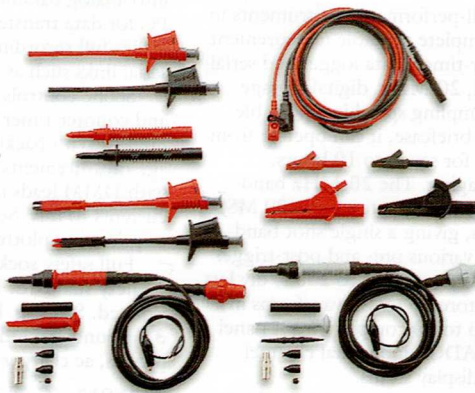
Fluke ScopeMeter® Series I and II Test Kit

Model 6120 Test Companion is designed for Fluke Series I and II ScopeMeter®s. A large briefcase-style Cordura carrying case with shoulder strap holds the included Pomona test accessories plus your ScopeMeter, service books, manuals, references and miscellaneous items. You get fully insulated X1/X10 switchable oscilloscope probes, test lead set, probe bodies with banana plug tip, flexible Grabber® test clips, grip clips, large safety alligator clips and medium alligator clips.

The rugged, lightweight case's interior features sturdy, easy-view pockets trimmed in Cordura. Grab your meter without putting the case down, or use the full-length zipper to lay it flat for full access. The 2.5-pound kit is 13.5" x 16.5" x 4.5". Accessories come with one-year warranties; the case has a 90-day warranty. *ScopeMeter is not included.*

630X995 6120 Test Companion Kit.....1-5, \$429.00 ea.; 6-up, \$386.00 ea.

ITT POMONA
Electronics





Model 224 60-MHz Handheld Digitizing Oscilloscope

- Isolated channel architecture
- 100-ns glitch capture
- Video line trigger and auto trigger
- Save reference memory
- Auto setup and save setup
- Detachable 1X/10X probes

Model 224 provides unsurpassed power in the world of handheld oscilloscopes. Capture measurements in out-of-the-way places with this battery-operated, compact, industrial service digitizing scope. This scope offers unmatched safety, versatility, features and ruggedness. The fully programma-

ble 60-MHz 224 samples at 10 MS/s for each channel and has an RS-232-C interface. Internal batteries eliminate the need for external power. It can charge and operate from 12-28 volts dc or 16-20 volts ac.

For ultimate operator safety, channels are fully isolated from each other and casing is double insulated. It is floatable to ± 850 V per channel for safe measurements on industrial power systems. This is the first scope UL listed for line voltage measurements to 600 V ac. It has a 6-kV peak surge rating.

Applications include power and high-voltage measurements, motor drive testing, electronic device debugging plus TV and video signal troubleshooting. Because of its compact size, bandwidth and portability, this is the perfect tool for high-speed electronics such as ATMs or avionics that can't be returned to a repair shop easily. Exclusive TV trigger makes it ideal for servicing medical imaging systems or closed-circuit surveillance equipment.

Auto Setup and Save/Recall limit the need for manipulation of the front panel. Pushing the Auto Setup button selects all input parameters. Save/Recall boosts productivity in repetitive testing at different locations by saving up to four front-panel setups. After you've acquired a waveform using Auto Setup, save it in one of four 512-byte records. Recall a known good signal for comparison and make necessary adjustments to bring equipment on line.

The 224 is packaged in impact-resistant plastic capable of withstanding 50 gs of force. It can operate accurately to temperatures as low as -10° C. Batteries allow a minimum of three hours of operation. Ballistic nylon carrying case doubles as a neck strap for hands-free operation. Includes two P850 10X replaceable probes, feet, probe accessory kit, ac adapter, RS-232-C guide, quick reference guide and operator's manual. Accessories are optional. The 4.4-pound unit is 3.4" x 6.3" x 9.9". Three-year warranty.

220X040 224 Oscilloscope Sorry, this item has been discontinued.



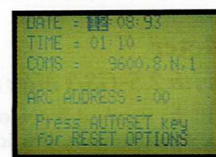
VC-5025A ScopeMaster Multi-Function Portable Oscilloscope

- Two channels, 20-MHz bandwidth and 5 mV/div sensitivity
- 20-MS/s max sampling, dual ADCs for time correlation
- 50 ns/div to 200 s/div timebase range, roll mode display
- Waveform printout, remote control from RS-232

ScopeMaster combines the power of five full-performance instruments in one compact unit at an exceptional price. A complete portable measurement laboratory, it is an oscilloscope, DMM, counter-timer, data logger and serial (RS-232) analyzer. This powerful, two-channel, 20-MHz, digital storage oscilloscope offers wide bandwidth and high sampling speed in a portable instrument. Small enough to fit in a tool kit or briefcase, it can operate from six 'C' size rechargeable or disposable batteries for seven to 10 hours.

Features autose, pre/post-trigger and averaging. The 20-MHz bandwidth is for repetitive signals using equivalent sampling rate up to 400 MS/s. For non-repetitive signals, max rate is 20 MS/s, giving a single shot bandwidth of 4 MHz. Variable pre-trigger captures various pre- and post-trigger waveform combinations. Extended timebase range of 50 ns to 200 s/div lets you display and store a wide range of signals. Store up to 10 waveforms in non-volatile memory for recall to screen and up to 20 complete front panel set-ups in non-volatile memory. Includes dual ADCs, individual channel freeze, waveform averaging, instant on-screen display status.

As a 3000-count DMM, it offers true-rms measurements, automatic or manual ranging and audible continuity check. Fast-update analog bar graph



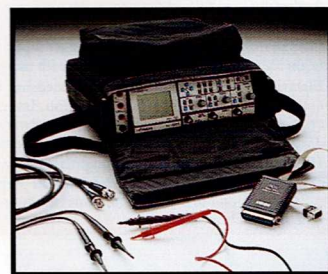
provides 100-segment bipolar (dc) or unipolar (ac and Ω) display on all ranges with 10-per-second update. The 20-MHz, eight-digit counter-timer supplies high accuracy and resolution. Crystal-controlled timebase accuracy exceeds .001% for measurements to .001 Hz. Measure in terms of period and frequency with high resolution for low-frequency measurement. For rotating machines, display frequency in rpm. Count pulses up to 99999999. In timer mode, resolve intervals up to 27 hours to 0.1 seconds.

The data logger boasts 1000 storable measurements, real time clock and linearization function to convert transducer and 4-20 mA current loops into analog parameters. Use an RS-232 interface to link the VC-5025A to a PC for data transfer or to a remote control. A serial (RS-232) analyzer furnishes full recording, triggering and display. It can interpret most data from serial links such as RS-232, RS-423 and RS-422 up to 19.6K baud.

Scope controls are grouped conventionally. Cursor keys control DMM and counter-timer functions. Access complex functions from on-screen menus. With backlit LCD and context-sensitive, on-screen help. Make voltage measurements with CH1 scope input. Measure resistance and current with DMM leads in 4-mm sockets. Resolve resistances to 0.1 Ω and measure currents to 3 A. Send waveforms, data logger results and data memory lists to printer or plotter. Dump waveforms to PC for storage or analysis.

Full safety sockets on DMM and scope conform with rigorous IEC 1010-1 safety standard. BNC sockets fully insulated; other connectors electrically isolated. Scope is 10.3" x 3.5" x 9.9" excluding handle and feet and weighs 3.9 pounds excluding batteries. Includes DMM leads, two 10X safety probes, ac charger, ni-cad batteries, case and manual. One-year warranty.

147X912 VC-5025A ScopeMaster Kit (Regular Price) \$1440.00 ea.
SPECIAL PRICE \$1253.00 ea.





VC-5400 Series

Color LCD Portable Digital Oscilloscopes

- Hitachi defines a new generation of digital oscilloscopes
- Portable series is so advanced you'll feel you're still in the lab
- Multi-function notebook-type portable scopes feature folding displays
- Well-organized operating environment provides simple operation

Hitachi's VC-5400 Series offers price, performance and flexibility in an advanced design concept. Now you have five choices of easy-to-use, compact, lightweight oscilloscopes with powerful measurement capabilities. The VC-5400 Series meets the power applications found in the lab plus the flexible requirements of field service.

Models VC-5410, VC-5430, VC-5460, VC-5470 and VC-5431 share many common features. These ergonomically designed sub-notebook DSOs are the first to use Hitachi's high-intensity TFT active color LCD technology. The most advanced field portable DSOs available today, they are des-

VC-5400 Series Functions

- **Display Functions:** Color discrimination, waveform display, ground level display, trigger level display, scale display
- **Processing Functions:** Averaging, calculations
- **Measurement Functions:** Cursor, pulse parameter and automatic measurement
- **Save Functions:** Waveform save/recall (pixel and waveform memories), setup save/recall, resume function
- **Timer Functions:** Real time clock, time function, auto power off
- **Input/Output Functions:** Interface, panel control, printer output, plotter output, calibration output

igned to change the standard by which other scopes are measured. High-speed sampling, wide bandwidth and large-capacity memory are combined in powerful tools for a wide range of applications. Use them for biomedical, communication, microcomputer and video field maintenance, inspection, installation and construction. Automatically rechargeable built-in batteries make them the perfect portable solutions for measurements at locations where commercial ac sources are unavailable, on transportation vehicles, of emergency electronics during power failures and in uninterruptible power supply unit maintenance and study.

Portability and laboratory power come in one tool in your choice of five models. Features include operability-oriented operation panel and high-quality waveform display. The eight-color 4-inch display features advanced CFL backlighting that meets high-tech field requirements for resolution, high contrast and fast waveform update in a portable instrument. Each scope has a folding display that offers high intensity with high-speed refresh approaching the quality of a CRT. Color-keyed displays of waveforms, setting values, cursors and measured values with 1500 words per waveform provide high readability. Capture high-speed complex signals with dual-channel DSO's two eight-bit A/Ds. Dual A/Ds (not available on Model 5460) allow accurate channel-to-channel timing. Deep 2-kW per channel memory (8-kW for Model 5470) stores waveforms internally. Battery backup of captured data simplifies field use.

VC-5400 Series analysis and measurement functions are advanced even by laboratory standards. Features include timed data acquisition and automatic pulse parameters. Four models offer go/no-go testing. Functions include resume, time and automatic power-off. This surprisingly small package offers a full complement of waveform observation, analysis, storage and recording functions. Dedicated keys are assigned to frequently made settings. Analog adjustments like position and level are made with individual rotating knobs. The result is an operating environment that is intuitively understandable. Save 10 sets of setup conditions in memory for recall when needed, enabling immediate start of measurement. The auto-setup function automatically optimizes range settings for best observation condition. Parameters measure 17 standard IEEE measurements for signal analysis. The active matrix display allows for clear viewing of four signals for comparison with up to 100 internal memories.

Pre-, post- and frequency-divided triggering are possible. The observation time position can be set anywhere in the range of 10 divisions before to 400 divisions after the trigger point, then returned to the zero position instantly. Make on-the-spot differential measurements of non-grounded communication networks like LANs and telephones. These portable DSOs are ideal for study, research and development, inspection and maintenance of battery-driven appliances, home computers and power supplies. Connect RS-232 interface to an external printer or plotter to generate hard copies.

The VC-5400 Series is novel in its compact design. Each of the models is small and lightweight enough to fit in an attaché case. A built-in battery is automatically rechargeable with the supplied ac adapter. Includes probes and operations manual. Choose from the affordable VC-5410, the powerful VC-5430, the full-featured VC-5460, the top-of-the-line VC-5470 and the unique VC-5431 video scope. You are sure to find a VC-5400 Series Hitachi Oscilloscope to meet your specific requirements. At 4.4 pounds with battery, each model measures 7.4" x 10.2" x 2.5". Three-year warranty.





NEW LOWER PRICES!

Model VC-5410

20-MHz Color LCD Oscilloscope

- 20-MHz bandwidth
- 15-MS/s max sample rate
- Two channels, 2 kW per channel
- 20-nS to 50-S/div timebase
- 10 setup/10 waveform memories

Use this affordable two-channel VC-5400 Series DSO for field service and general bench applications where cost is critical. The VC-5410 offers most of the advanced features pioneered by the VC-5430 in a basic model. You get color LCD, 20-MHz bandwidth, 15 megasample per second per channel sampling, active matrix color display, dual A/Ds, autosetup, full programmability, deep 2-kW per channel waveform memory, 10 setup/10 waveform memories, waveform parameters, differential input and RS-232/Centronics ports. Battery life is two hours.

147X913 VC-5410 DSO (Regular Price)\$1835.00 ea.
SPECIAL PRICE\$1590.00 ea.

Model VC-5430

50-MHz Color LCD Oscilloscope

- 50-MHz bandwidth
- 30-MS/s max sample rate
- Two channels, 2 kW per channel
- 5-nS to 50-S/div timebase
- 10 setup/100 waveform memories
- Go/no-go mask testing

Hitachi's original two-channel Model VC-5430 offers more power than the basic Model VC-5410. This proven DSO features 4-inch color TFT LCD with CFL backlighting, wide 50-MHz bandwidth (for high-speed logic signals, audio, video and sensors), high-speed 30 megasample per second per channel sampling (eight bits, two channels simultaneously), active matrix color display, dual A/Ds, autosetup, full programmability, deep 2-kW per channel waveform memory, 10 setup/100 waveform memories, waveform parameters, go/no-go mask testing, differential inputs and trigger plus RS-232/Centronics ports. Use the Model VC-5430 to find intermittent signal problems and automatically log to memory or hardcopy. Unique features include scope input channels CH1, CH2 and EXT plus differential mode and vertical axis variable. Battery life is two hours.

147X914 VC-5430 DSO (Regular Price)\$2525.00 ea.
SPECIAL PRICE\$2190.00 ea.

Model VC-5460

150-MHz Color LCD Oscilloscope

- 150-MHz bandwidth
- 60-MS/s max sample rate
- Two channels, 2 kW per channel
- 2-nS to 50-S/div timebase
- 10 setup/100 waveform memories
- Go/no-go mask testing

This 150-MHz two-channel Hitachi oscilloscope is packed with powerful features, yet it is still conveniently portable. Use it to transport the latest advancements to the field. The 4-inch color TFT liquid crystal display provides CFL backlighting. Model VC-5460 also offers wide 150-MHz bandwidth (for high-speed logic signals, audio, video and sensors) plus high-speed 60-megasample-per-second sampling rate for one channel with 30 MS/s rate for two channels. Model VC-5460's other impressive features include active matrix color display, autosetup, full programmability, deep 2-kW per channel waveform memory, 10 setup/100 waveform (2-kW) memories, waveform parameters, go/no-go mask testing, differential inputs and trigger plus RS-232/Centronics ports. Use this DSO to find intermittent signal problems and automatically log to memory or hardcopy. Battery life is one hour.

147X915 VC-5460 DSO (Regular Price)\$3330.00 ea.
SPECIAL PRICE\$2890.00 ea.

Model VC-5470

150-MHz Color LCD Oscilloscope

- 150-MHz bandwidth
- 100-MS/s max sample rate
- Two channels, 8 kW per channel
- 2-nS to 50-S/div timebase
- 10 setup/100 waveform memories
- Go/no-go mask testing

The new top-of-the-line two-channel oscilloscope in the Hitachi VC-5400 Series is Model VC-5470. It offers all the valuable functions of the Model VC-5460 plus a wealth of powerful new features. The 4-inch color TFT liquid crystal display provides CFL backlighting. Model VC-5470 offers a high-speed simultaneous 100-megasample-per-second-per-channel sampling rate for two channels. Acquisition memory capacity is deep 8-kW per channel in real time sampling mode with 3.2-kW per channel in peak detect mode. All glitches of more than 10 ns can be captured in peak detect mode. Envelope is 2-2048 (power of 2) or limitless.

Other features include wide 150-MHz bandwidth in equivalent sampling mode with 50-MHz bandwidth in other modes, active matrix color display, autosetup, full programmability, 10 setup memories, 100 waveform (2 kW waveform) or 25 waveform (8-kW waveform) memories, waveform parameters, go/no-go mask testing, differential inputs and trigger plus RS-232/Centronics ports. Use this powerful Model VC-5470 to find intermittent signal problems and automatically log to memory or hardcopy. Battery life is 30 minutes.

147X919 VC-5470 DSO (Regular Price)\$4020.00 ea.
SPECIAL PRICE\$3490.00 ea.

VC-5400 Series Features

- Smaller than a notebook computer, each model weighs just 4.4 pounds
- High-intensity eight-color 4-inch TFT LCDs feature high-speed refresh
- Operability-oriented operation panel and high-quality waveform display
- Time data acquisition and automatic pulse parameters
- Differential inputs and trigger
- Fully programmable via RS-232C interface
- Built-in battery power simplifies field use where ac source is unavailable
- Choose from five feature/price packages including new video scope with picture monitor, waveform monitor and vectorscope capabilities



Model VC-5431

50-MHz Color LCD Digital Video Scope

- 50-MHz bandwidth
- 30-MS/s max sample rate
- Two channels, 2000 words per channel
- 5-nS to 50-S/div timebase
- 10 setup/20 waveform memories
- Go/no-go mask testing
- Picture monitor (full-color display)
- Waveform monitor (1 H, 2 H, 1 μ s/div, 2 V and 2 V MAG display)
- Vector scope

This unique Hitachi VC-5400 Series model is a portable 50-MHz multi-video measuring color oscilloscope. In addition to standard scope functions, the sub-notebook-sized, battery-operated VC-5431 provides video capabilities. You get an oscilloscope, picture monitor, waveform monitor and vector scope all conveniently combined in a single versatile unit. NTSC TV form is a unique special feature. Applications include video/signal and TV observation, CATV system installation plus remote monitoring and maintenance of public network systems.

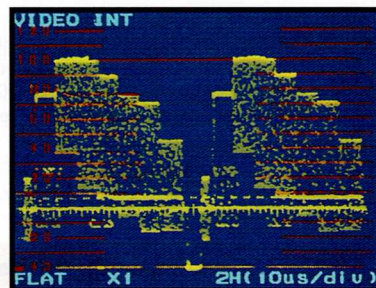
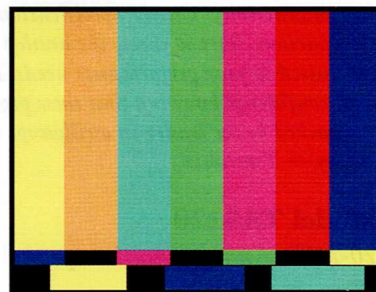
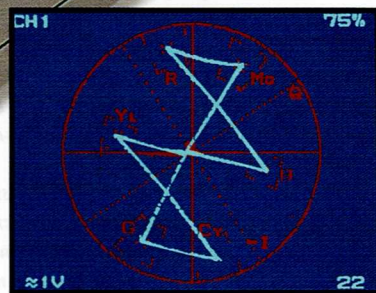
Model VC-5431 features a color TFT LCD with backlighting. The high-intensity, high-contrast active matrix color display offers high-speed refresh rate. This model includes wide 50-MHz bandwidth (for high-speed logic signals, audio, video and sensors) plus high-speed 30-megasample-per-second-per-channel sampling (eight bits, two channels simultaneously). Other features include dual A/Ds, autosetup, full programmability, deep 2-kW per channel waveform memory, 10 setup/20 waveform memories, waveform parameters, go/no-go mask testing, differential inputs and trigger plus RS-232/Centronics ports.

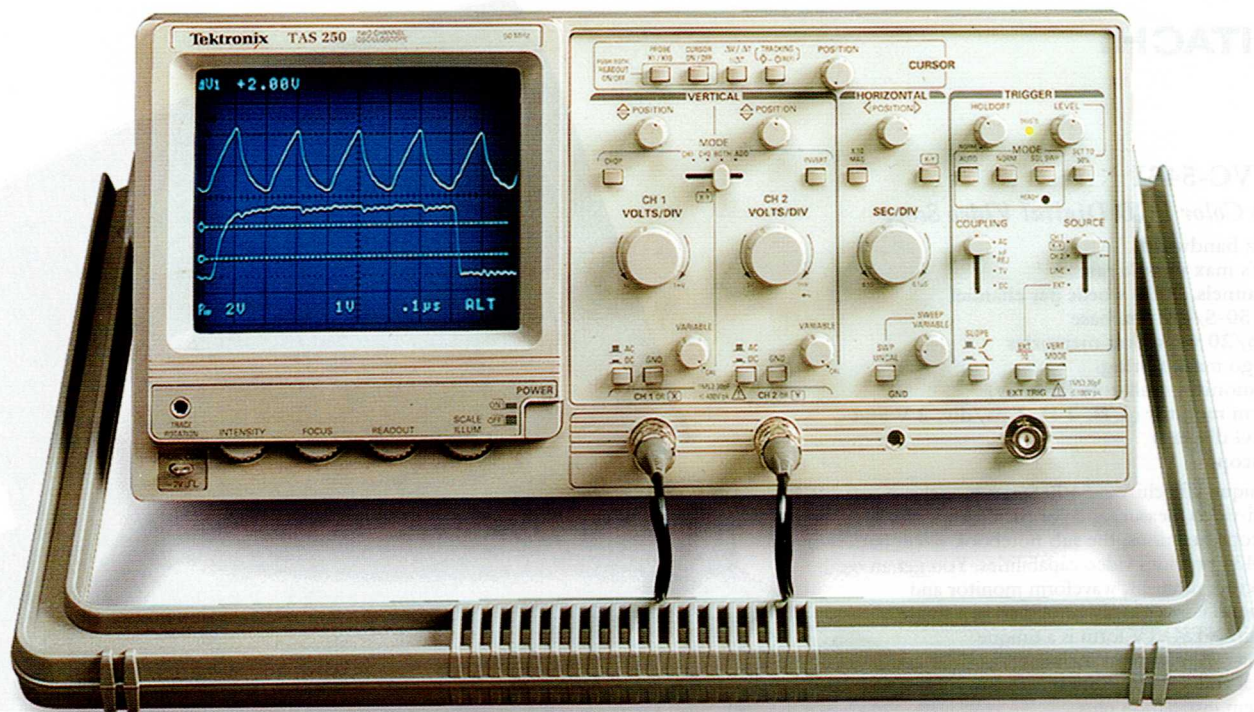
The VC-5431 can find intermittent signal problems and automatically log to memory or printer (RS-232C/Centronics). Hardcopy output excludes picture monitor. Battery life is one hour. Weighing 4.4 pounds with battery and measuring 7.4" x 10.2" x 2.5", this sub-notebook-size video scope offers superior portability. Three-year warranty.

147X917 VC-5431 DSO (Regular Price)\$4585.00 ea.
SPECIAL PRICE\$3990.00 ea.

VC-5431 Specifications

Bandwidth	50 MHz
Max Sample Rate	30 MS/s
Channels	Two
Record Length	2000 words per channel
Vertical Sensitivity	1 mV to 5 V per division (12 ranges)
Timebase	5 nS to 50 S/div
Setup/Waveform Memories	10/20
Go/No-Go Mask Testing	✓
Waveform Parameters	Cursor Measurements V, T, 1/T, V @ T Parameters: Voltage (V p-p, V rms, V avg, V min, V max, V ampl, V ovrsh, V undrsh) Time (Freq, Period, Pulse Width (+), Pulse Width (-), Duty, Rise, Fall)
PC Interface	RS-232
Printer Interface	Centronics or RS-232
Color Display	✓
Picture Monitor	✓
Waveform Monitor	✓
Vectorscope	✓





TAS 200 Series Analog Oscilloscopes

Welcome to a new level of power and flexibility for general-purpose measurements at affordable prices. The TAS 200 Series is part of the TekBench™ portfolio of high-value, affordable basic instruments. They are safe and reliable tools for troubleshooting and performance verification applications in training, manufacturing production testing, field repair, bench calibration and repair plus product design.

The TAS 200 Series user interface simplifies scope operation. Important, frequently used functions are controlled directly with knobs or buttons. Both models provide measurement cursors and readouts to improve user productivity. Use the Specification Comparison chart to choose the analog scope best suited to your performance needs. Buy with confidence knowing that these products are backed by the leader in oscilloscope technology — Tektronix.

Tektronix

Analog Oscilloscope Specification Comparison

	TAS220	TAS250
Bandwidth	20 MHz	50 MHz
Input Channels	2	2
Rise Time	<17.5 ns	<7 ns
Time Base	Single	Single
Main Sweep Range	0.5 s/div to 0.1 μs/div	0.5 s/div to 0.1 μs/div
Delayed Sweep Range	N/A	N/A
Vertical Accuracy	±3%	±3%
Vertical Sensitivity	5 mV to 5 V/div	5 mV to 5 V/div
Horizontal Accuracy	±3%	±3%
X10 Horizontal Accuracy	±5%	±5%
Sweep Speed (X10 mag), Main	10 ns	10 ns
Sweep Speed (X10 mag), Delayed	N/A	N/A
Trigger Modes	AUTO, NORMAL, TV, SGL Sweep	AUTO, NORMAL, TV, SGL Sweep
Trigger Coupling (both Main and Delayed)	AC, DC	AC, DC
Cursors and Readouts	Yes	Yes
CRT	2 kV	12 kV
Warranty	One Year	One Year
Safety Certification	ETL, CSA	ETL, CSA

Model TAS220 20-MHz Analog Oscilloscope

- Two channels
- Measurement cursors
- CRT Readout

This 20-MHz analog oscilloscope's features include single time base, two channels, measurement cursors, crt readout, Channel 1 output, video trigger and direct access controls. Model TAS220 includes two 1X/10X 1.5 m probes and instruction manuals. The 20-pound instrument measures 15" x 9.5" x 18". One-year warranty.

TAS220 Analog Oscilloscope
220X845 1-2, \$795.00 ea.; 3-up, \$765.00 ea.

Model TAS250 50-MHz Analog Oscilloscope

- Two channels
- Measurement cursors
- CRT readout

The TAS250 is a 50-MHz analog oscilloscope with single time base, two channels, measurement cursors, crt readout, Channel 1 output, video trigger and direct access controls. It comes complete with two 1X/10X 1.5 m probes and instruction manuals. This 20-pound scope measures 15" x 9.5" x 18". One-year warranty.

TAS250 Analog Oscilloscope
220X850 1-2, \$1195.00 ea.; 3-up, \$1150.00 ea.

For information on Tektronix Oscilloscope Accessories, please refer to Pages 180-182 of this catalog.



Model OS-5020P

20-MHz, Two-Channel, Dual-Trace Real-Time Oscilloscope

- Sensitivity 1 mV/div
- Channel 2 polarity inversion switch
- High-sensitivity X-Y mode
- ISO 9001

GoldStar's basic real-time oscilloscope is designed to meet the low-cost requirements of schools and hobbyists. Model OS-5020P is the 20-MHz, two-channel, dual-trace model.

The 6-inch, large-size, high-luminance CRT has internal graticule. Other features include ALT triggering function (VERT mode) and sweep magnification (x10). Surface-mount technology provides high performance and reliability. A TV sync separator circuit provides stable TV signal observation. The internal video signal synchronization separator enables stable triggering of video signals. Dual-channel X-Y operation is simultaneously displayed in the CHOP mode with CH1 as the X-axis and CH2 as the Y-axis. Measurements of the Lissajous figures and phase shift can be made.

Model OS-5020P includes two spare fuses, power cord and operator's manual. This 7.8-kg scope is 316 mm x 143 mm x 406 mm. Two-year warranty.

120X450 Model OS-5020P Oscilloscope

REGULAR PRICE.....\$599.00 ea.

SPECIAL PRICE.....\$459.00 ea.



Model OS-9100P

100-MHz, Two-Channel, Dual-Trace Real-Time Oscilloscope

- Wider than specified frequency
- Signal delay with delay line useful for observation of signal start point
- Auto focusing according to the change of intensity
- Drift compensation circuit employed in vertical amplifier for low drift
- Jitterless and high-trigger sensitivity

This advanced real-time oscilloscope is designed to meet the low-cost requirements of schools and hobbyists. Model OS-9100P is GoldStar's top-of-the-line 100-MHz, two-channel, dual-trace version.

Many unique features add versatility to this model. Any portion of the signal displayed with the main time base can be magnified by the full scale delay sweep function. Both the magnified wave and original wave can be displayed simultaneously by the ALT sweep function. Using signal delay, the leading edge of a high-speed pulse signal can be observed with delay line.

Standard features include 6-inch, large-size, high-luminance CRT with internal graticule plus ALT triggering function (VERT mode) and sweep magnification (x10). Surface-mount technology provides high performance and reliability. A TV sync separator circuit provides stable TV signal observation. The internal video signal synchronization separator enables stable triggering of video signals. Dual-channel X-Y operation is simultaneously

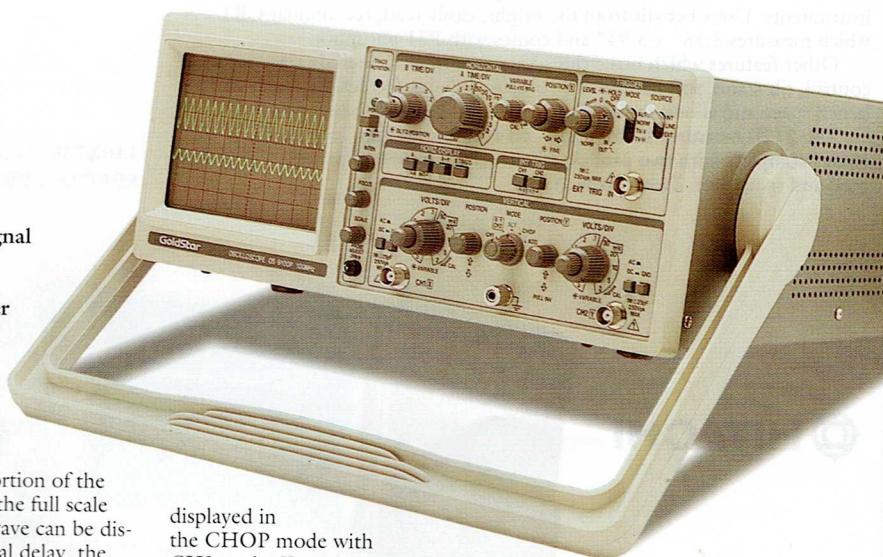
displayed in the CHOP mode with CH1 as the X-axis and CH2 as the Y-axis. Measurements of the Lissajous figures and phase shift can be made.

The OS-9100P includes two spare fuses, power cord and operator's manual. This 8.5-kg scope is 320 mm x 140 mm x 430 mm. Two-year warranty.

120X500 Model OS-9100P Oscilloscope

REGULAR PRICE.....\$1250.00 ea.

SPECIAL PRICE.....\$989.00 ea.



Oscilloscope Specification Comparison

Description		Model OS-9100P	Model OS-5020P
CRT	Type	6-inch rectangular screen with internal graticule: 8 x 10 div (1 div = 1 cm)	6-inch rectangular screen with internal graticule: 8 x 10 div (1 div = 1 cm)
	Acceleration Potential	+10.5 kV approx. (ref. cathode)	+1.9 kV approx. (ref. cathode)
Vertical Deflection (CH1 and CH2)	Bandwidth (-3 dB)	DC: 10 Hz-100 MHz; 10 Hz-20 MHz (2-mV range)	DC Coupled: DC to 20 MHz normal/DC to 10 MHz magnified (CH1 only)
	Modes	CH1, CH2, ADD, ALT, DUAL, CHOP	CH1, CH2, ADD, ALT, DUAL, CHOP
	Deflection Factor	2 mV/div-5 V/div in 11 calibrated steps of 1-2-5 sequence	5 mV/div-5 V/div in 10 calibrated steps of 1-2-5 sequence
	Accuracy	±3%	±3%
	Maximum Input Voltage	250 V (dc + peak ac) or (400 V p-p at 1 kHz or less)	250 V (dc + peak ac)
	Input Coupling	AC-GND-DC	DC-GND-AC
Horizontal Deflection	Time Base A	0.1 μS/div-0.2 s/div in 20 calibrated steps of 1-2-5 sequence	0.2 μS/div-0.2 s/div in 19 calibrated steps of 1-2-5 sequence
	Time Base B	0.1 μS/div-10 μs/div in 7 calibrated steps of 1-2-5 sequence	0.2 μS/div-0.2 s/div in 19 calibrated steps of 1-2-5 sequence
Trigger System	Modes	Auto, norm, TV-V, TV-H	Auto, norm, TV-V, TV-H
	Source	CH1, CH2, LINE, EXT	VERT, CH1, LINE, EXT
	Coupling	AC	AC
	Slope	+ or -	+ or -
	Vert Mode	CH1 and CH2	CH1
		At least 1 div or 1 V p-p	At least 1 div or 1 V p-p



Model 2120

Economical, 20-MHz Dual-Trace Oscilloscope

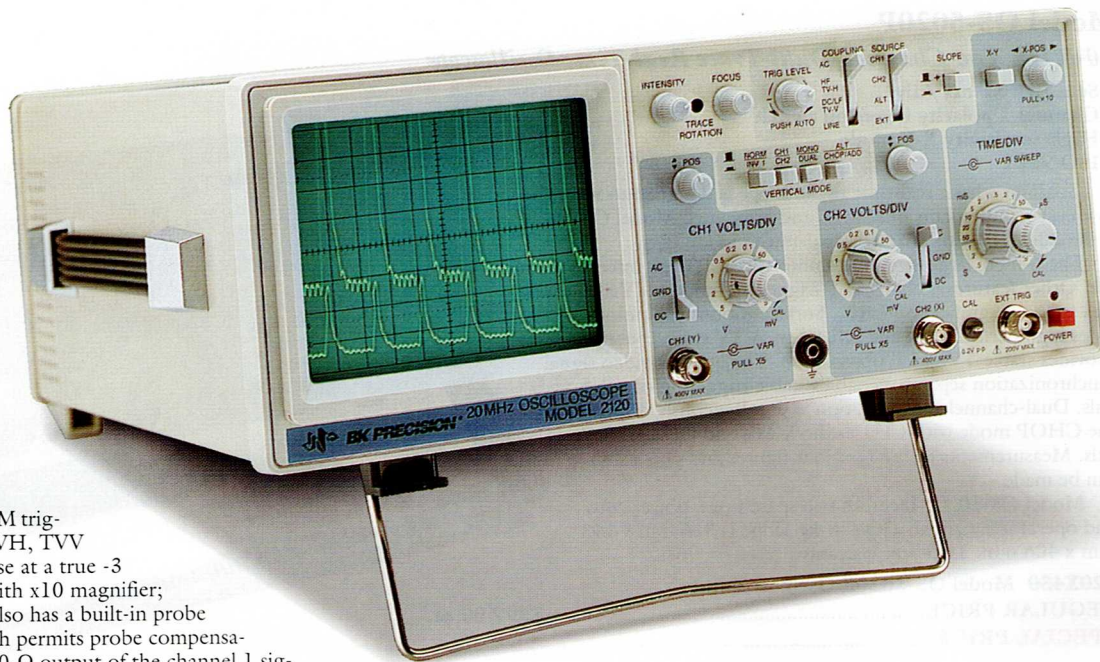
- DC to 20 MHz
- Selectable trace, single or dual
- Sum/difference capability feature
- Incredible \$459 price!

The B&K Model 2120 offers the ultimate in low-cost, dual-trace, 20-MHz measurement technology. It delivers easy selection of single- or dual-trace operation with 3% accuracy and a vernier control that is fully adjustable between steps and increases the maximum sensitivity to 1 mV/div.

Features include AUTO/NORM triggered sweep operation with ac, TVH, TVV and line coupling; 2-MHz response at a true -3 dB; calibrated 18-step timebase with x10 magnifier; and X-Y operation. Model 2120 also has a built-in probe adjust square wave generator which permits probe compensation adjustment. And a buffered 50-Ω output of the channel 1 signal is available at the rear panel for driving a frequency counter or other instruments. Users benefit from the bright, easily read, rectangular CRT which measures 3.15" x 3.94" and comes with P31 phosphor.

Other features which make this scope user-friendly include trace rotation control, tilt stand, soft handle and compact low-profile design which saves bench space and allows the unit to be carried like a briefcase.

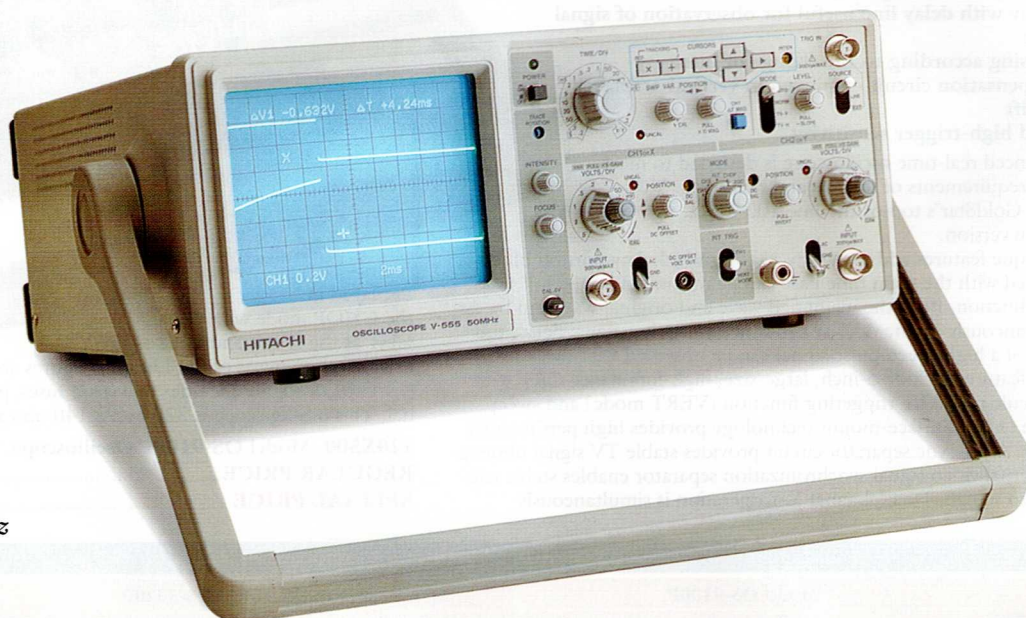
The 2120 measures 12.6" x 5.1" x 14.2" and weighs 15 pounds. It comes complete with two probes, schematic diagram and parts list, ac power cord and spare fuse. Two-year warranty.



BK PRECISION
MAXTEC INTERNATIONAL CORP.

110X730 2120 20-MHz Oscilloscope (Regular Price).....\$579.00 ea.
SPECIAL PRICE\$459.00 ea.

HITACHI



Model V-555

Cursor Readout 50-MHz Real-Time Oscilloscope

- DC to 50 MHz
- Dual channels
- Provides fundamentals in waveform operation

Hitachi's Basic Series Model V-555 features easy operation, quality, reliability and performance in a two-channel real-time oscilloscope. Direct readings of measured values are extremely simple and accurate. A low failure rate is achieved by active application of past-failure feedback data. This oscilloscope provides the fundamentals in waveform operation.

The V-555's design achieves compact, lightweight portability with a large 6-inch CRT with internal graticule. Its ergonomically designed knob layout is easy to operate. An electrostatic charge repellent blue filter enables reading even in bright locations. This oscilloscope features include TV sync trigger, readout, cursor measurement, dc offset, alternate magnification plus voltage and time difference.

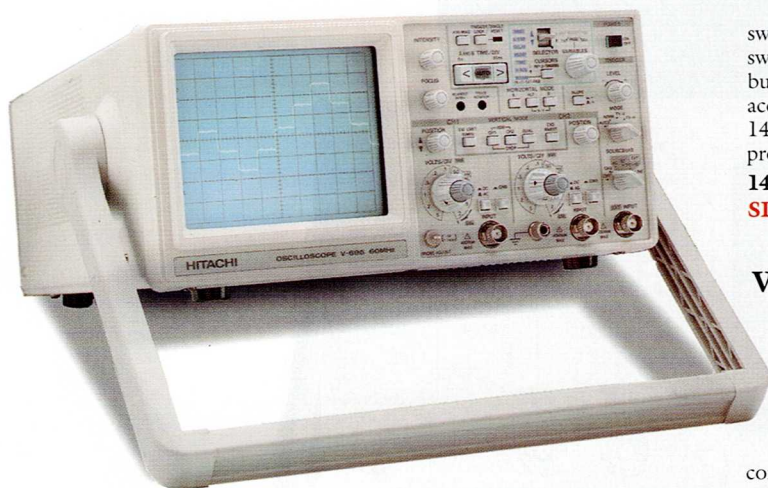
CRT specifications include acceleration potential (approximately 12 kV), trace rotation, autofocus, Z-axis input sensitivity (at least 5 V p-p), frequency range (dc to 2 MHz) and max input voltage (30 V, dc + ac peak).

Vertical system specifications include sensitivity (5 mV/div to 5 V/div) with $\pm 3\%$ accuracy, bandwidth (dc to 50 MHz), x5 mag bandwidth (dc to 7 MHz), max input voltage (300 V dc + ac peak at 1 kHz) and input impedance (approximately 1 MΩ, approximately 25 pF). The max sweep rate is 20 ns/div, and the max sensitivity is 1 mV/div (x5). A CRT readout setting display offers CH1 sensitivity and sweep time. Cursor measurement provides simultaneous readout of voltage and time. Trigger modes include auto, norm, TV-V and TV-H.

Model V-555 comes complete with two voltage probes, ac power cord, fuse and operation manual. It measures 12.2" x 5.1" x 14.5" and weighs 15.4 pounds. Three-year warranty.

147X525 V-555 50-MHz Scope (Regular Price).....\$1260.00 ea.
SPECIAL PRICE\$1090.00 ea.





V-695 Two-Channel Real-Time Oscilloscope 60-MHz Compact Cursor Readout Model

The V-695 60-MHz oscilloscope is a two-channel model with delayed sweep, CRT readout, cursor readout, frequency counter, trigger lock and sweep time autoranging. By using two cursors displayed on the CRT and built-in counter, direct readings of measured values are extremely simple and accurate. Lightweight and portable, the V-695 measures 10.8" x 5.1" x 14.1" and weighs 13.2 pounds. Complete with two AT-10AP1.5 voltage probes, ac power cord, fuse and operation manual.

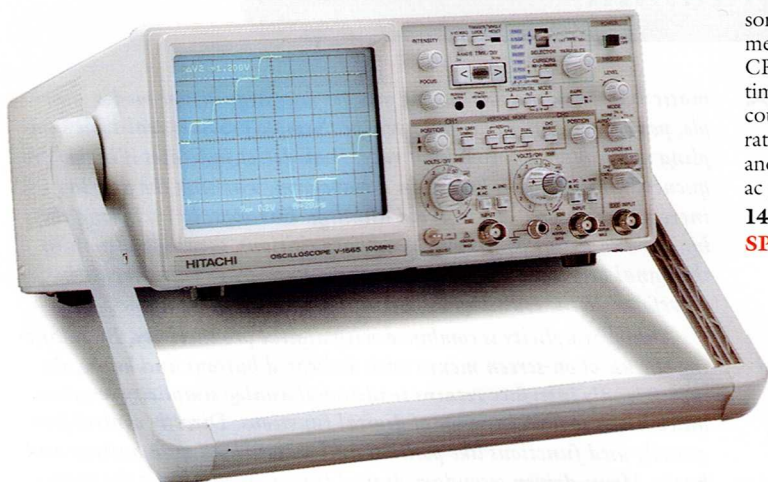
147X665 V-695 Oscilloscope (Regular Price)\$1785.00 ea.
SPECIAL PRICE\$1545.00 ea.

V-1560 Two-Channel Real-Time Oscilloscope 100-MHz Basic Compact Model

You get the power of increased 100-MHz bandwidth capability in Model V-1560 (not pictured). This basic two-channel oscilloscope features delayed sweep, trigger lock and sweep time autoranging. At 13.2-pounds, it has compact dimensions of 10.8" x 5.1" x 14.1". The V-1560 comes complete with two AT-10AP1.5 voltage probes, ac power cord, fuse and operation manual.

147X901 V-1560 Oscilloscope (Regular Price)\$1950.00 ea.
SPECIAL PRICE\$1690.00 ea.

NEW LOWER PRICES!



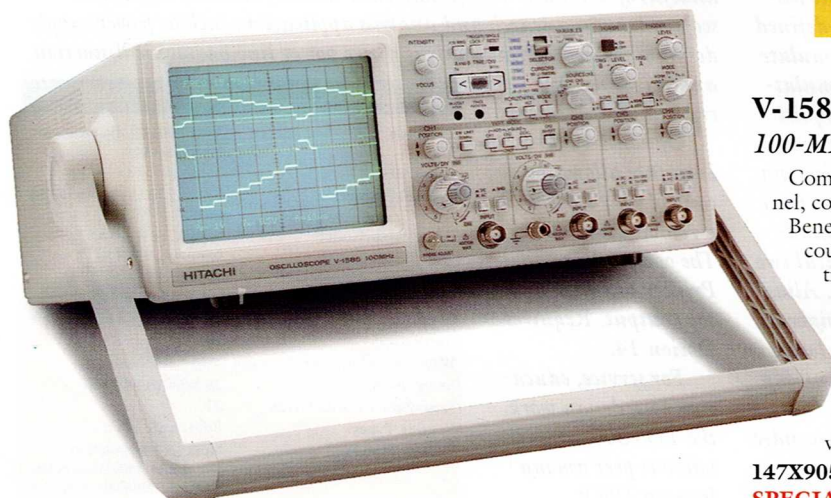
V-1565 Two-Channel Real-Time Oscilloscope 100-MHz Compact Cursor Readout Model

With 100-MHz power, outstanding benefits, incredible features plus cursor capabilities, V-1565 includes everything necessary for truly advanced measurement capability. The two-channel model features delayed sweep, CRT readout, cursor readout, frequency counter, trigger lock and sweep time autoranging. By using two cursors displayed on the CRT and built-in counter, direct readings of measured values are extremely simple and accurate. Lightweight and portable, the V-1565 measures 10.8" x 5.1" x 14.1" and weighs 13.2 pounds. Complete with two AT-10AP1.5 voltage probes, ac power cord, fuse and operation manual.

147X902 V-1565 Oscilloscope (Regular Price)\$2065.00 ea.
SPECIAL PRICE\$1790.00 ea.

New Basic Series Compact RTO Features

- Easy operation, quality, reliability and stability provide the basics in waveform observation
- Electrostatic charge repellent blue filter enables reading in even bright locations
- Autofocus automatically adjusts the focus to suit display intensity
- Sweep time autoranging automatically optimizes the sweep time
- Ergonomically designed knob layout
- Ample margin in specifications with guaranteed specs at 10°-35° C
- Thorough reliability testing of parts
- High reliability befitting a measuring instrument
- Low failure rate achieved by active application of past-failure feed-back data



V-1585 Four-Channel Real-Time Oscilloscope 100-MHz Compact Cursor Readout Model

Compact and lightweight V-1585 brings Hitachi quality to a four-channel, compact scope. It delivers 100-MHz bandwidth and $\pm 3\%$ accuracy. Benefits include delayed sweep, CRT readout, cursor readout, frequency counter, trigger lock, sweep time autoranging and triggerable operation. By using two cursors displayed on the CRT and built-in counter, direct readings of measured values are extremely simple and accurate. Autoranging makes the difficult optimum sweep time selection a push of a button. CRT setting readout eliminates costly setting errors. Cursors link observation with measurement for easy, direct reading of values. At 12.2" x 5.1" x 14.5", 15.4 pounds, it comes complete with two AT-10AP1.5 voltage probes, ac power cord, fuse and operation manual.

147X905 V-1585 Oscilloscope (Regular Price)\$2525.00 ea.
SPECIAL PRICE\$2190.00 ea.





TDS 300 Series Digital Real-Time Oscilloscopes

- Two input channels
- 2 mV/div to 10 V/div
- 8-bit vertical resolution
- Dot accumulate and vector accumulate display modes
- 2% vertical accuracy
- 21 automatic measurements
- 10-ns peak detect mode for high-speed glitch capture

The TDS 300 Series redefines the low-cost digital oscilloscope with real-time performance. No other DSOs offers as much bandwidth and sample rate for the price. Sampling the signal at up to five times the bandwidth on both channels simultaneously assures true acquisitions, minimizing aliasing or other digital sampling effects. Easily gather enough samples to display waveforms accurately to their full bandwidth. These are the only scopes in their class that acquire high-speed transient or single-shot events reliably over their entire bandwidth.

Many low-cost DSOs offer only dot displays which can be hard to interpret, especially for those accustomed to analog scopes. But the TDS 300 Series has dot, dot accumulate, vector and vector accumulate displays. Accumulate modes gather multiple waveforms for a user-defined time (500 ms to ∞) after which the screen is erased. Vector accumulate uses bright vectors to superimpose current acquisition over accumulated waveforms. Display is erased at user-defined time or when acquisition setting is changed. These modes are useful for worst-case analysis or signal monitoring. Set erase time to infinity for long-term monitoring.

Oversampling minimizes aliasing. Scopes sample at five times their bandwidth, assuring accurate real-time acquisition up to full bandwidth, even for single-shot events. This is well beyond the theoretical two samples per period necessary for a DSO to acquire a true signal. Aliasing occurs if a DSO cannot sample at least twice as fast as the highest frequency component, and the scope displays a waveform with a lower frequency than the actual input signal. A high degree of oversampling minimizes aliasing and provides a higher resolution waveform.

You also get acquisition power. With edge triggering and basic video triggering standard, the TDS 300 Series can capture the waveforms that designers and service technicians must see. In addition to 21 auto-

Tektronix

matic waveform measurements, you get four acquisition modes: sample, peak detect, envelope and average. Sample provides real-time sampling at the highest throughput rate. Peak detect indicates if higher frequency information is buried in a waveform, warning the user to increase the sweep speed to avoid aliasing. Envelope, by including the highest and lowest points over many acquisitions, shows variations in the signal over time. Average calculates an average value for each waveform point, reducing apparent noise in repetitive signals.

Analog simplicity is combined with digital productivity. By balancing the use of on-screen menus with dedicated buttons and knobs, the user-friendly interface retains traditional analog simplicity yet gives quick access to a wide range of digital functions. Directly control frequently used functions like position and trigger level with buttons and knobs. Menu-driven secondary digital functions eliminate the profusion of buttons found on most low-cost scopes. A modern graphical user interface dramatically reduces learning time. It simplifies scope operation without limiting the instrument's capabilities.

Waveform functions are extended through the addition of live FFT analysis of averaged waveforms. These added functions make these scopes ideal for research and analysis applications such as power supply design and mechanical analysis where power line harmonic distortion and resonance are critical measurements.

Option 14 I/O
Interface allows you to control your scope with a remote computer. The optional Thermal Printer provides hard copy output. Requires Option 14.

For service, education and design work, the TDS 300 Series is without peer among low-cost DSOs.

TDS 300 Series Common Specifications

Channels	Two identical channels with invert function
Sensitivity	2 mV-10 V/div
Vertical Resolution	8 bits (256 levels over 10.24 vertical divisions)
Acquisition Modes	Sample, peak detect, envelope, average
Peak Detect/Glitch Capture	10 ns
Record Length/Channel	1000 sample points
Waveform Processing	Add, subtract, multiply, FFT
Autosetup	Yes
Waveform Storage/References	Two 1 K records
Store/Recall	10 front-panel setups
Automatic Measurements	21
Trigger Types	Edge, basic video
Display System	Sin(x)/x interpolation; dot, dot accumulate, vector, vector accumulate; format



Model TDS 380

Digital Real-Time Oscilloscope

- 400-MHz bandwidth
- 2-GS/s sampling rate on each channel

This is the most powerful model in the TDS 300 Series with a full 400-MHz bandwidth. It acquires signals across its entire bandwidth with minimal aliasing, even when measuring high-speed transient and single-shot events. Sample rate is 2 GS/s. Time base system (main and delayed) time/division range is 2.5 nanoseconds to 5 seconds per division. Use a built-in 3.5-inch, 1.44-MB or 720-KB DOS-compatible floppy disk drive to save waveforms and screen data for import into desktop publishing programs and transfer to PC that can read these formats.

Option 14 I/O Interface Field Upgrade Kit allows you to control your TDS 300 Series Oscilloscope with a remote computer. Includes GPIB, RS-232 I/O interface, VGA output, Centronics-type parallel port and programmer manual. The optional 120-Volt Thermal Printer Field Upgrade Kit includes ac adaptor, thermal paper roll, interface cable and pouch. Requires Option 14.

TDS 380 includes two P6114B 10X passive probes, U.S. power cord, NIST-traceable certificate of calibration plus reference and user manuals. This 15.5-pound unit is 14.25" x 6.5" x 18.6". Three-year warranty excludes probes.

220X840 TDS380 Oscilloscope.....1-2, \$4595.00 ea.; 3-up, \$4415.00 ea.

220X842 TDS380-14 Option 14 I/O Interface Field Upgrade Kit.....\$120.00 ea.

220X955 TDS4F5P 120-Volt Printer Pack Field Upgrade Kit\$495.00 ea.

Tektronix



Model TDS 360

Digital Real-Time Oscilloscope

- 200-MHz bandwidth
- 1-GS/s sampling rate on each channel

Model TDS 360 is the mid-range TDS 300 Series scope with 200-MHz bandwidth. It acquires signals across its entire bandwidth with minimal aliasing, even when measuring high-speed transient and single-shot events. Sampling rate is 1 GS/s on each channel. Time base system (main and delayed) time/division range is 2.5 nanoseconds to 5 seconds per division. Use a built-in 3.5-inch, 1.44-MB or 720-KB DOS-compatible floppy disk drive to save waveforms and screen data for import into popular desktop publishing programs and transfer to PC that can read these formats.

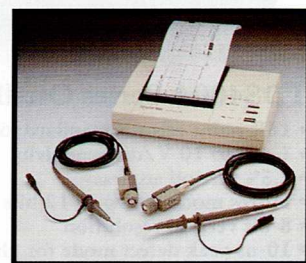
Option 14 Field Upgrade Kit allows you to control your TDS 300 Series Scope with a remote computer. Includes GPIB, RS-232 I/O interface, VGA output, Centronics-type parallel port and programmer manual. The optional Printer Field Upgrade Kit includes ac adaptor, thermal paper roll, interface cable and pouch. Requires Option 14.

Model TDS 360 includes two P6111B passive probes, U.S. power cord, NIST-traceable certificate of calibration plus reference and user manuals. The 15.5-pound unit measures 14.25" x 6.5" x 18.6". Three-year warranty excluding probes.

220X835 TDS360 Oscilloscope.....1-2, \$3595.00 ea.; 3-up, \$3455.00 ea.

220X837 TDS360-14 Option 14 I/O Interface Field Upgrade Kit\$120.00 ea.

220X955 TDS4F5P 120-Volt Printer Pack Field Upgrade Kit\$495.00 ea.



Printer Field Upgrade Kit



Model TDS 340

Digital Real-Time Oscilloscope

- 100-MHz bandwidth
- 500-MS/s sampling rate on each channel

The TDS 340 is a basic, low-cost Tektronix TDS 300 Series oscilloscope with 100-MHz bandwidth. Like the other models in this series, it has the power to acquire signals over its entire bandwidth with minimal aliasing, even when measuring high-speed transient and single-shot events. Sample rate is 500 megasamples per second on each channel. Time base system (main and delayed) time/division range is 5 nanoseconds to 5 seconds per division.

Option 14 I/O Interface Field Upgrade Kit allows you to control your TDS 300 Series Oscilloscope with a remote computer. Use this combination for automated testing or to exchange waveform or measurement data for documentation or analysis. Includes GPIB, RS-232 I/O interface, VGA output, Centronics-type parallel port and programmer manual. The optional 120-Volt Thermal Printer Field Upgrade Kit includes ac adaptor, thermal paper roll, interface cable and pouch. Option 14 is required for printer usage.

TDS 340 comes with two P6109B 10X passive probes, U.S. power cord, NIST-traceable certificate of calibration plus reference and instruction manuals. The 15-pound unit measures 14.25" x 6.5" x 18.6". Three-year warranty excluding probes.

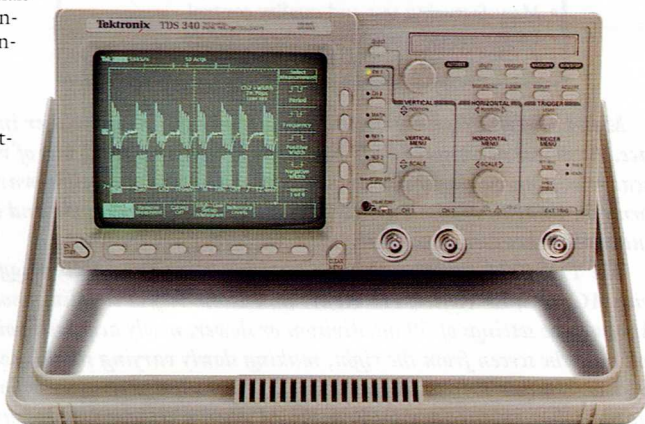
220X830 TDS340 Oscilloscope1-2, \$2695.00 ea.; 3-up, \$2588.00 ea.

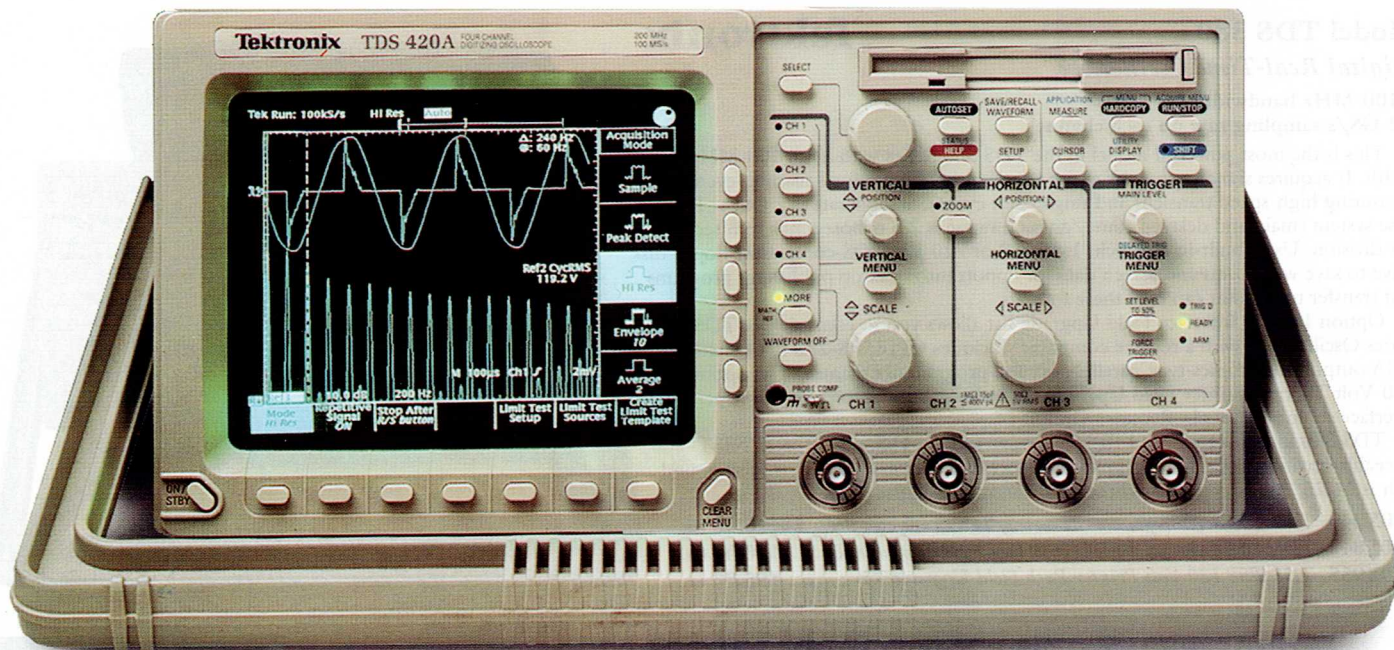
220X833 TDS340-14 Option 14 I/O Interface Field Upgrade Kit.....\$320.00 ea.

220X955 TDS4F5P 120-Volt Printer Pack Field Upgrade Kit\$495.00 ea.

TDS 300 Series Specification Comparison

	TDS 380	TDS 360	TDS 340
Bandwidth	400 MHz	200 MHz	100 MHz
Sample Rate (Each Channel)	2 GS/s	1 GS/s	500 MS/s
Time/Division Range	2.5 ns to 5 s/div	2.5 ns to 5 s/div	5 ns to 5 s/div
Built-in Floppy Disk Drive	Yes	Yes	No





TDS400A Series Oscilloscopes

- 15K point records standard; 60K optional
- 1 mV to 10 V/div sensitivity
- 1.5% vertical accuracy
- Hi-res mode for up to 12 bits of single-shot vertical resolution
- 8-bit vertical resolution
- 10-ns peak detect mode for glitch capture
- Pass/fail waveform testing
- Roll and triggered roll modes
- 25 automatic measurements
- GPIB programmable
- Infinite and variable persistence
- NIST tractability and MIL-A compliance now standard

The TDS400A Series high-performance two-channel TDS410A plus four-channel TDS420A and TDS460A oscilloscopes are suited to electromechanical and medical research, circuit design, electronic service and manufacturing quality control. They provide high-speed transient or single-shot acquisition with extended record length and math performance. Ideal for complex signal measurement and precision analysis. Scopes offer wide dynamic range, fast overdrive recovery, flat response, 1-mV/div sensitivity and calibrated dc offset. Bandwidths of 150 MHz (TDS410A and TDS420A) and 350 MHz (TDS460A), 100-MS/s sampling rate and record lengths to 60,000 points provide acquisition power and flexibility.

TDS400A Series Applications

- Biophysical research and biomedical research
- Electrophysical and electromechanical system design
- Audio system measurement and analysis
- Manufacturing test and quality control
- Power supply and power-related design
- Product service and maintenance

Many powerful features are integrated into the intuitive user interface. At slower sweep speeds, Hi-Res mode provides up to 12 bits of vertical resolution on single-shot events. A zoom feature magnifies waveforms for analysis of small details. Template testing, roll mode and 25 automated measurements make these products work for you.

The TDS400A Series scopes have sensitive, wide bandwidth triggers with AC, DC, LF Reject, HF Reject and Noise Reject coupling modes. At timebase settings of 50 ms/division or slower, newly acquired points roll onto the screen from the right, making slowly varying signals easier to view. Unique Triggered Roll Mode lets user view pretrigger information, then capture a waveform record when a trigger event occurs.

Tektronix

Twenty-five automatic measurements eliminate the counting of divisions and manual cursor measurements. The user can set reference levels. In addition, measurement gating allows selection of a specific part of a waveform for measurement. The Snapshot feature simultaneously makes all 25 measurements on any single waveform.

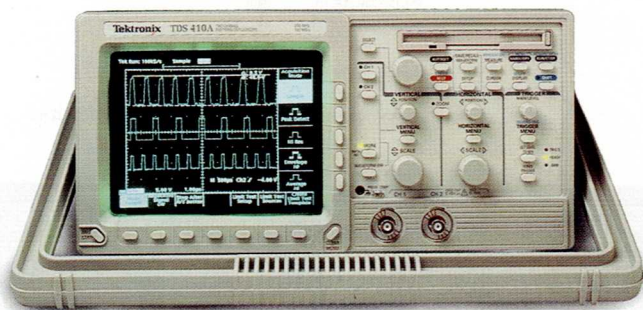
At slow sweep speeds, digitizing scopes reach a point where the available record length limits the number of samples that can be retained per second. Most scopes react by saving a point every few points and discarding the rest — missing high-speed waveform details. Peak Detect Mode employs proprietary hardware to retain data about those extra points and shows detail up to the maximum sample rate.

Variable Persistence allows waveform points to decay gradually through a 16-level gray scale, providing "z-axis" information about rapidly changing signals. Limit Testing compares waveforms against a template on-the-fly, automatically stopping acquisitions or saving waveform whenever the template is violated. Templates can be created and adjusted from the front panel or imported over the GPIB interface and saved in non-volatile memory. NIST tractability and MIL-A compliance are now standard on all TDS400A Series Oscilloscopes. Add more power with options.

TDS400A Series Oscilloscope Specifications

	TDS410A	TDS420A	TDS460A
Bandwidth	200 MHz	200 MHz	400 MHz
Digitizers	2	4	4
Common Specifications			
Time Base	Dual		
Maximum Sample Rate (each channel)	100 MS/s		
Vertical Resolution	8 bits (up to 12 bits with Hi-Res)		
Vertical Sensitivity	1 mV/div to 10 V/div		
Acquisition Modes	Peak Detect, Sample, Envelope, Average, Hi-Res		
Peak Detect/Glitch Capture	10 ns		
Record Length/Channel	500 to 15 K points; 60 K points with Option 1M		
Signal Processing	Linear or Sin(x)x Interpolation, Average, Envelope, Add, Subtract, Invert, Multiply, FFT, Integration, Differentiation with Option 2F		
Automatic Measurements	25 plus Snapshot		
Trigger	Main, Delayed, Basic Video, SGL SEQ, AC, DC, LF Reject, HF Reject, Noise Reject		
Video Trigger Types	NTSC, PAL, SECAM, Custom; TV field, field 2 or both, any line with a field (Option O5)		
Display	Dot, Vector, Gray Scale, VGA Out		
I/O Interface	GPIB		
Safety Certification	UL, CSA		





Model TDS410A

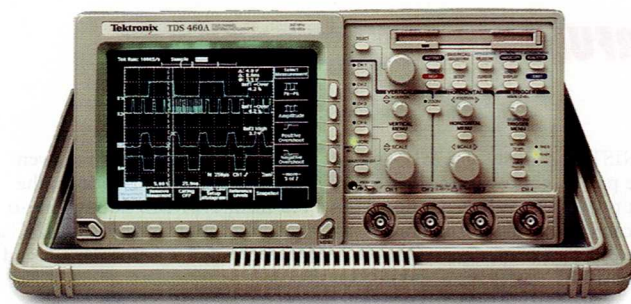
Two-Channel 200-MHz Digitizing Oscilloscope

- 200-MHz bandwidth
- Two channels each with 100-MS/s sampling rate

This is the Tektronix basic personal lab scope. It is shown with Option 1F, but the disk drive must be purchased separately. Includes two P6138 10X passive probes, U.S. power cord, certificate of tractability, Performance Verification Document plus Reference, User and Programming manuals. The 22.5-pound unit is 6.4" x 14.25" x 19.25". Three-year warranty.

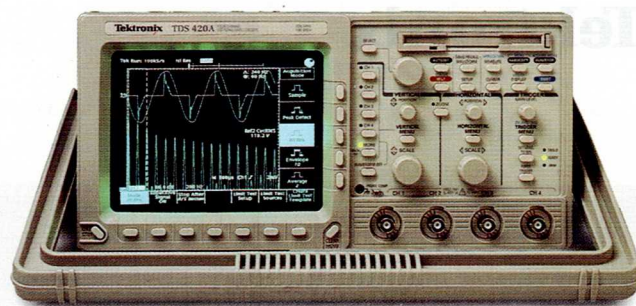
220X900	TDS410A Oscilloscope.....1,	\$4950.00 ea.; 2-up, \$4750.00 ea.
220X902	Opt. 1F (Floppy Disk Drive) ..1,	5445.00 ea.; 2-up, 5230.00 ea.
220X904	Opt. 1M (Extended Rec.) .....1,	5765.00 ea.; 2-up, 5535.00 ea.
220X906	Opt. 02 (Cover/Pouch) .....1,	5010.00 ea.; 2-up, 4810.00 ea.
220X908	Opt. 2F (Adv. DSP Math).....1,	5945.00 ea.; 2-up, 5710.00 ea.
220X909	Opt. 3P (Printer Pack).....1,	5675.00 ea.; 2-up, 5450.00 ea.

Tektronix



25 Automatic Measurements

• Period	• Minimum	• + Overshoot	• Cycle RMS
• Frequency	• Rise	• - Overshoot	• Area
• High	• Fall	• Propagation Delay	• Cycle Area
• Low	• Peak-to-Peak	• Burst Width	• Phase
• + Width	• Amplitude	• Mean	
• - Width	• + Duty Cycle	• Cycle Mean	
• Maximum	• - Duty Cycle	• RMS	



Model TDS420A

Four-Channel 200-MHz Digitizing Oscilloscope

- 200-MHz bandwidth
- Four channels each with 100-MS/s sampling rate

The TDS420A is the mid-range TDS400A Series scope. It is shown with Option 1F, but the disk drive must be purchased separately. Includes two P6138 10X passive probes, U.S. power cord, certificate of tractability, Performance Verification Document plus Reference, User and Programming manuals. The 22.5-pound unit is 6.4" x 14.25" x 19.25". Three-year warranty.

220X920	TDS420A Oscilloscope .....1,	\$6295.00 ea.; 2-up, \$6050.00 ea.
220X922	Opt. 1F (Floppy Disk Drive) ..1,	6790.00 ea.; 2-up, 6520.00 ea.
220X924	Opt. 1M (Extended Rec.) .....1,	7390.00 ea.; 2-up, 7095.00 ea.
220X926	Opt. 02 (Cover/Pouch) .....1,	6355.00 ea.; 2-up, 6100.00 ea.
220X928	Opt. 2F (Adv. DSP Math) .....1,	7290.00 ea.; 2-up, 6995.00 ea.
220X929	Opt. 3P (Printer Pack).....1,	7020.00 ea.; 2-up, 6740.00 ea.

Model TDS460A

Four-Channel 400-MHz Digitizing Oscilloscope

- 400-MHz bandwidth
- Four channels each with 100-MS/s sampling rate

Model TDS460A is the top-of-the-line personal lab scope. It is shown with Option 1F, but the disk drive must be purchased separately. Includes two P6138 10X passive probes, U.S. power cord, certificate of tractability, Performance Verification Document plus Reference, User and Programming manuals. The 22.5-pound unit measures 6.4" x 14.25" x 19.25". Three-year warranty.

220X940	TDS460A Oscilloscope.....1,	\$7685.00 ea.; 2-up, \$7380.00 ea.
220X942	Opt. 1F (Floppy Disk Drive) ..1,	8180.00 ea.; 2-up, 7850.00 ea.
220X944	Opt. 1M (Ext. Record 120K) ..1,	8780.00 ea.; 2-up, 8425.00 ea.
220X946	Opt. 02 (Cover/Pouch) .....1,	7745.00 ea.; 2-up, 7435.00 ea.
220X948	Opt. 2F (Adv. DSP Math).....1,	8680.00 ea.; 2-up, 8330.00 ea.
220X949	Opt. 3P (Printer Pack).....1,	8410.00 ea.; 2-up, 8075.00 ea.
220X950	Opt. 05 (Video Trigger) .....1,	8680.00 ea.; 2-up, 8332.00 ea.

Accessories

DocuWave™ Software — Publishing and archiving software for DOS and Windows.

220X825	\$60DWA DocuWave™ Software	\$195.00 ea.
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For more Oscilloscope Accessories, please refer to pages 173-174.

Add More Power with Options

Option 1F 3.5" DOS Floppy Drive

This option is shown in the photos above, but it must be purchased separately. Use the 3.5" DOS-format floppy disk drive to save waveforms and screen data in over 14 user-selectable formats (including spreadsheets and MathCad™) for import into popular desktop publishing programs or for transfer to a PC for further analysis. Makes technical documentation and management presentations extremely convenient.

Option 1M 120 K Point Record Length

Each acquisition channel has 30,000 point records standard. Option 1M boosts this to 120,000 points per channel for applications where high timing resolution is needed over a long duration. Examples include complex slow varying signals found in mechanical test, power, bio-physical research and automotive research.

Option 2F Extended Waveform Math; FF, Integration and Differentiation

Option 2F extends signal processing, adding live FFT, integration and

differentiation analysis. Researchers and designers use these functions for everything from harmonic distortion analysis to power supply design.

Option 02 Front Cover and Accessories Pouch

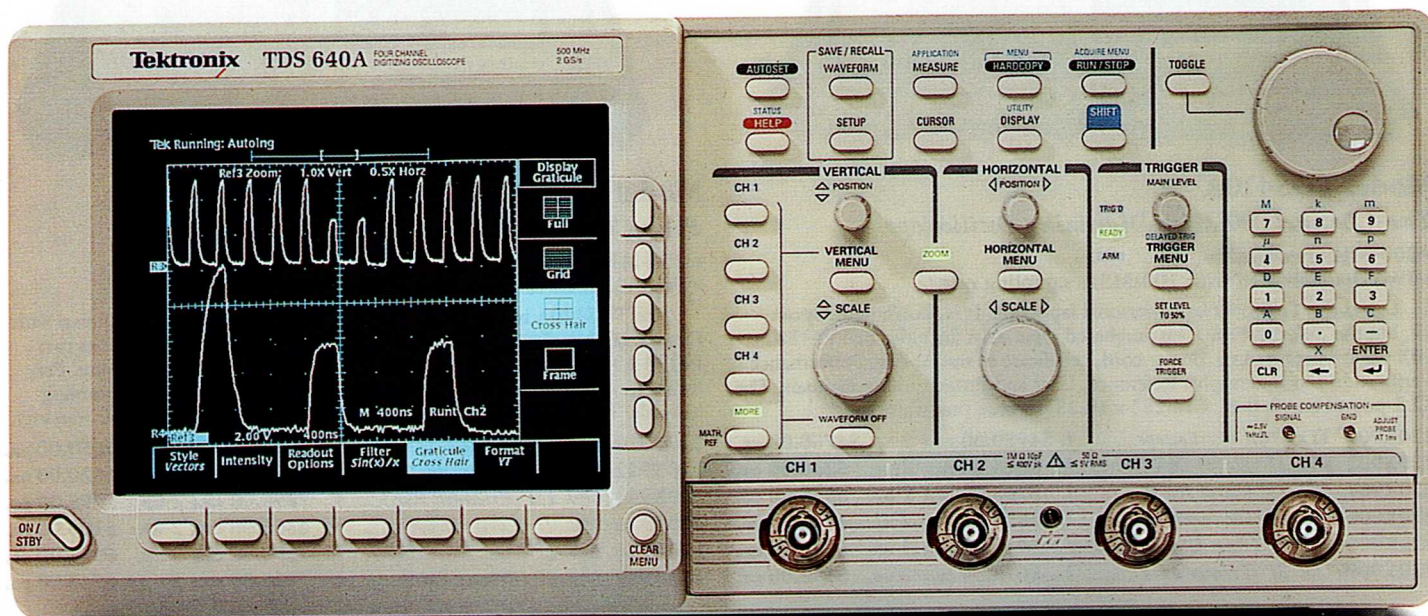
Option 3P Printer Pack

Printer Pack provides a single-handle, single-power cord solution to your portable printing needs. The 4-inch thermal printer in a scope-top pouch provides clear, quiet hardcopies. A dedicated print spooler keeps you working even during printing. It also adds RS-232 and Centronics-type interfaces plus 14 export file formats to allow users to send data to most printers, plotters and desktop publishing programs.

Option 05 Video Trigger Types

NTSC, PAL, SECAM, and Custom; TV field 1, field 2 or both. Any line within a field.





OUR MOST POWERFUL SCOPE!

Model TDS640A

Digital Real-Time Oscilloscope

- 500-MHz bandwidth
- 2-GS/s sample rate on four channels
- Time interval, 2-ns glitch, runt, pattern and state triggering
- 1-mV to 10-V/div sensitivity
- Infinite and variable persistence
- 8-bit resolution; 11-bit with averaging
- 1.5% vertical accuracy
- Full GPIB programmability
- NIST tractability and MIL-A compliance now standard

The TDS640A Oscilloscope provides an excellent combination of affordability and high performance. It delivers full 500-MHz bandwidth and 2-gigasample per second digital real-time acquisition on all channels simultaneously. Tektronix's intuitive interface combines dedicated controls with graphical displays, icon-based menus and on-line help. The TDS 640A also offers extensive triggering capabilities and 25 automatic measurements.

Display system features dot or vector waveform style with infinite and variable persistence. Includes YT and XY display formats. Waveform storage is four full 2000-point records and 10 front panel setups. Power requirements are 90-250 V rms, 47-63 Hz and 300 W maximum. Time base system features main and delayed time bases. Specifications include time/div range (500 ps-5 s/div); time base accuracy (± 100 ppm over any interval ≥ 1 ms); record length (500-2000 points) and pre-trigger position (20%-80% of record). Trigger system specifications include trigger types (edge: main and delayed); pulse (width, glitch and runt); logic (pattern and state) plus video (NTSC, PAL and FlexFormat™).

Vertical system specifications are bandwidth selections (20 MHz, 100 MHz and full); input coupling: ac, dc or gnd; input impedance selections (1 M Ω in parallel with 10 pF or 50 Ω : ac and dc coupling); maximum input voltage (± 400 V: dc + peak ac, derate at 20 dB/decade above 1 MHz); channel isolation ($>100:1$ at 100 MHz, $>30:1$ at bandwidth for any two channels with equal V/div settings); plus ac coupled LF limit (≤ 10 Hz when ac 1 M Ω coupled, ≤ 200 kHz when ac 50 Ω coupled). Automatic measurements include period/frequency, high/low, +width/-width, maximum/minimum, rise/fall, peak to peak/amplitude, +duty cycle/-duty cycle, +overshoot/-overshoot, propagation delay/burst width, mean/cycle mean, rms/cycle rms, area/cycle area and phase.

NIST tractability and MIL-A compliance are now standard. For even more power, choose from three factory-installed instrument options, the most popular Tech Sets. Option 1F is a 3.5-inch, 1.44-MB floppy disk so you can download information to diskette. Use Option 13 for RS-232-C and Centronics-type interfaces. Option 2F is for extended waveform math and includes FFT, integration and differentiation.

Model TDS640A Specifications

Bandwidth	500 MHz
Channels	4
Max Sample Rate per Channel	2 GS/s
Sensitivity	1 mV-10 V/div
Position Range	± 5 div
Offset	± 1 V from 1 to 99.5 mV/div ± 10 V from 100 to 995 mV/div ± 100 V from 1 to 10 V/div (all four channels)
DC Gain Accuracy	$\pm 1.5\%$
Vertical Resolution	8 bits
Monitor	7 inch, 640 x 480, Monochrome
VGA Output	Monochrome

This UL-listed oscilloscope includes four P6139A active FET probes, front cover, U.S. power cord, certificate of tractability, reference card, user manual, programmer's manual and performance verification. The 27.2-pound unit is 9.2" x 17.4" x 16.8". Three-year warranty excluding probes.

TDS640A Oscilloscope

220X959 1, \$9750.00 ea.; 2-up, \$9360.00 ea.

TDS640A -1F Oscilloscope with 1F Floppy Disk Option

220X480 \$9920.00 ea.

TDS640A -13 with 13 RS-232-C and Centronics-Type Interfaces

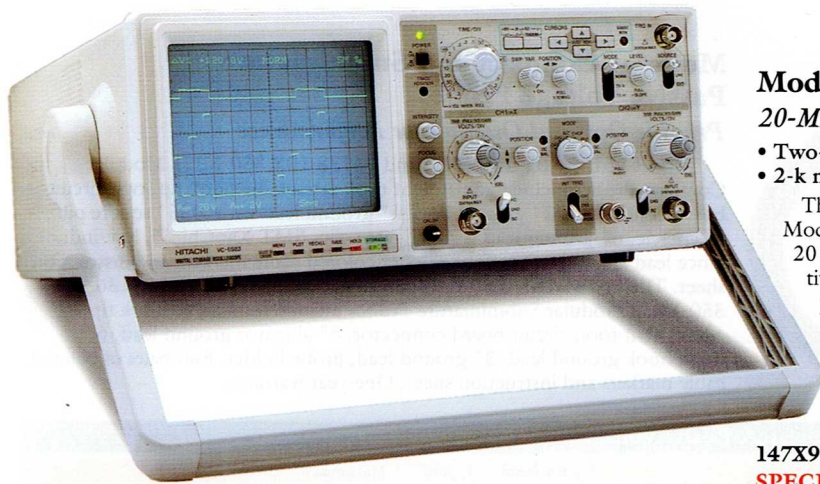
220X475 \$9920.00 ea.

TDS640A -2F Oscilloscope with 2F Math Option

220X470 \$10,420.00 ea.



NEW LOWER PRICES!



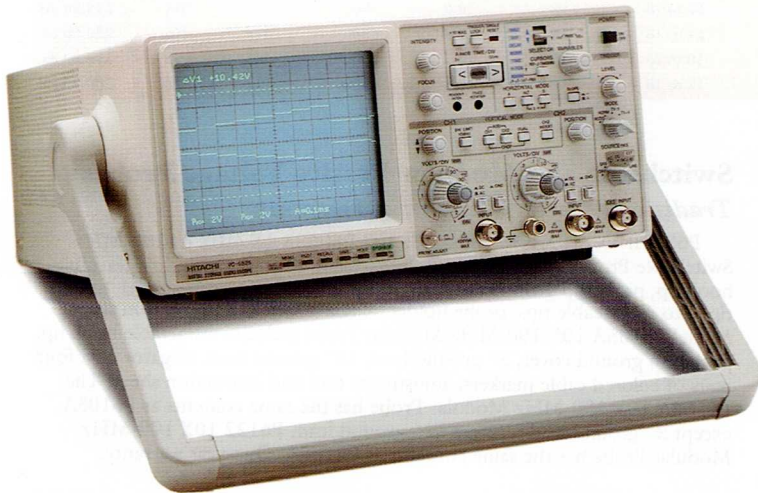
Model VC-6523

20-MHz Digital Storage Scope

- Two-channel, simultaneous scope
- 2-k memory (record length)

The value leader in Hitachi's RSO series of digital storage oscilloscopes, Model VC-6523 offers a full 20 MHz of digital or analog bandwidth (at 20 MS/s sampling rate). This single time base scope has a vertical sensitivity of 1 mV, vertical resolution of 8 BITS, 2-k record length, signal processing for enhanced viewing, pretriggering, CRT/cursor movement readout, RS-232C and X-Y plotter interfaces plus all other RSO features that distinguish these Hitachi DSOs. The VC-6523 measures 12" x 5" x 14.5", weighs just under 18 pounds and comes with two 10:1/1:1 switchable probes, ac power cord, fuse and extensive operations manual. Three-year warranty.

147X916 Model VC-6523 DSO (Regular Price).....\$2100.00 ea.
SPECIAL PRICE.....\$1790.00 ea.



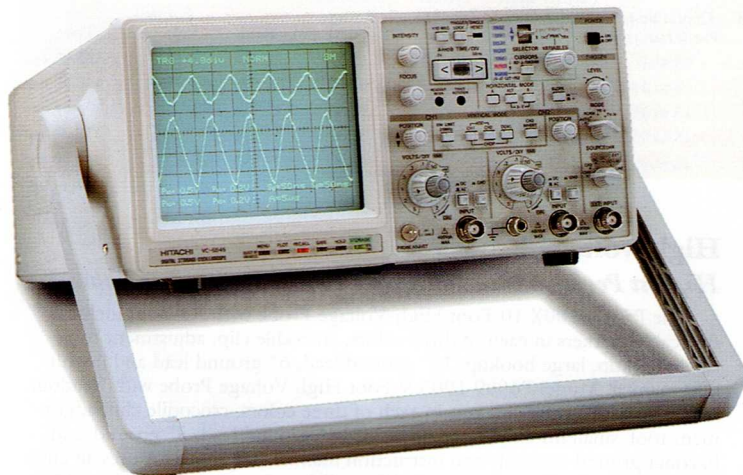
Model VC-6525

50-MHz DSO with Counter Function

- Two-channel, dual timebase
- 2-k memory (record length)

Model VC-6525 perfectly blends the benefits of real time oscilloscopes with the power and functionality of digital storage oscilloscopes. A full 50-MHz bandwidth (digital and analog) with a 20-MS/s sampling rate, it is the workhorse DSO in Hitachi's line. Its incredible features include a choice of three sampling modes (normal, roll or sequential), 2-k memory capacity, battery backup (stores up to two complete waveforms) along with all the other standard RSO features like RS-232C and X-Y plotter interfaces. The VC-6525 measures about 11" x 5" x 14", weighs 15.5 pounds and is supplied complete with two 10:1/1:1 switchable probes, ac power cord, fuse and extensive operations manual. Three-year warranty.

147X920 Model VC-6525 DSO (Regular Price).....\$3099.00 ea.
SPECIAL PRICE.....\$2690.00 ea.



Model VC-6545

100-MHz DSO with Counter Function

- Two-channel, dual timebase
- 4-k memory (one channel)

Our most popular digital storage oscilloscope. The incredibly powerful VC-6545 includes all the features of the other Hitachi RSOs like pretriggering, CRT/cursor readout, RS-232C and X-Y plotter interfaces plus the added versatility of a full 100-MHz capacity and a very fast 40-MS/s sampling rate. Like the VC-6525, this scope will display four waveforms simultaneously (two stored and two real time) with a full 4-k word record length memory. Features Trigger Lock and Autoranging. The 15.5-pound unit is 11" x 5" x 14". Includes two 10:1/1:1 switchable probes, ac power cord, fuse and operations manual. Three-year warranty.

147X925 Model VC-6545 DSO (Regular Price).....\$3330.00 ea.
SPECIAL PRICE.....\$2890.00 ea.

New Basic Digital Oscilloscope Features

- Real-time and storage oscilloscopes prove that a digital storage function does not have to make a scope large
- Easy DSO operation is straightforward by using six push-buttons located under the Bezel
- Digital oscilloscopes feel like analog scopes
- Capture elusive one-shot and intermittent phenomenon
- Observe static observation of non-repeating phenomenon
- Storage function observes low-speed phenomenon as a trace
- Produce hardcopies of waveform data with external plotter
- Use averaging to reduce noise
- Readout function with cursor measurements
- RS-232C interface transfers waveform data





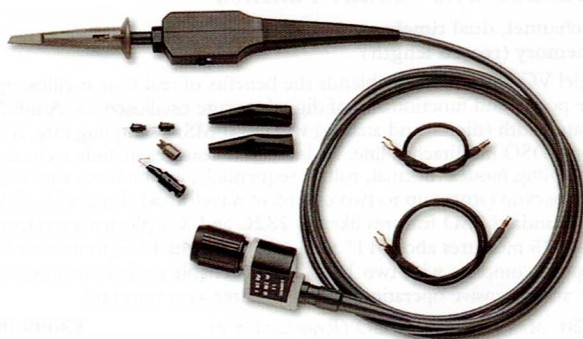
Modular Compact and Subminiature Passive Voltage Probes

Provide Optimal Oscilloscope Performance

Model P6137 10X 400-MHz and P6138 10X 350-MHz Modular Compact Probes include adjustment tool, retractable hook tip, two circuit board connectors, 2" ground lead, 6" ground lead with .025" square pin receptacle, 6" ground lead with alligator clip, SMT KlipChip™, low-inductance lead ground collar, four pairs of colored cable markers and instruction sheet. The P6131 10X 300-MHz, P6133 10X 150-MHz and PS136 10X 350-MHz Modular Subminiature Probes include retractable hook tip, adjustment tool, circuit board connector, 8" alligator ground lead, 6" microhook ground lead, 2" ground lead, probe holder, four pairs of colored cable markers and instruction sheet. One-year warranty.

Modular Compact and Subminiature Passive Voltage Probe Specifications

Stock No.	Part No.	Description	Cable Length (Meters)	Attenuation	Bandwidth (MHz)	Comp. Range PicoFarads (pF)	System Input Resistance (MΩ)	Typical Input C (pF)	Maximum Voltage DC+pk AC (V)	Readout	Ground Reference	Price
220X660	P6137	Modular Compact Passive Probe	1.5	10X	400	12 to 18	10	10.8	≤500	Yes	Yes	\$250.00 ea.
220X662	P6138	Modular Compact Passive Probe	1.3	10X	350	12 to 18	10	10.0	≤500	Yes	Yes	215.00 ea.
220X631	P6131	Modular Subminiature Passive Probe	1.3	10X	300	14 to 18	10	10.8	≤500	Yes	No	220.00 ea.
220X638	P6133	Modular Subminiature Passive Probe	2	10X	150	10 to 25	10	12.7	≤500	Yes	No	195.00 ea.
220X656	P6136	Modular Subminiature Passive Probe	1.3	10X	350	12 to 18	10	10.8	≤500	No	No	230.00 ea.



Switchable and Modular Passive Voltage Probes

Traditional Performance from Tektronix

P6062B 1X/10X 6.5/100-MHz and P6063B 1X/10X 6/200-MHz Switchable Probes with Ground Reference and Readout include retractable hook tip, probe tip ground cover, 5" ground lead, 12" ground lead, hook tip, two replaceable tips, probe holder, alligator clip and instruction sheet. Model P6105A 10X 100-MHz Modular Probe includes retractable hook tip, probe tip ground cover, 5" ground lead, 12" ground lead, alligator clip, four pairs of colored cable markers, adjustment tool and instruction sheet. The P6106A 10X 250-MHz Modular Probe has the same contents as P6105A except 3" ground lead replaces 12" ground lead. P6122 10X 100-MHz Modular Probe has the same contents as P6105A. One-year warranty.

Switchable and Modular Passive Voltage Probe Specifications

Stock No.	Part No.	Description	Cable Length (Meters)	Attenuation	Bandwidth (MHz)	Comp. Range PicoFarads (pF)	System Input Resistance (MΩ)	Typical Input C (pF)	Maximum Voltage DC+pk AC (V)	Readout	Ground Reference	Price
220X562	P6062B	Switchable Passive Probe	2	1X/10X	6.5/100	15 to 47	1/10	14/105	≤500	Yes	Yes	\$325.00 ea.
220X566	P6063B	Switchable Passive Probe	2	1X/10X	6/200	15 to 24	1/10	14/105	≤500	Yes	Yes	445.00 ea.
220X575	P6105A	Modular Passive Probe	2	10X	100	15 to 35	10	11	≤500	Yes	Yes	200.00 ea.
220X580	P6106A	Modular Passive Probe	2	10X	250	15 to 35	10	11	≤500	Yes	Yes	235.00 ea.
220X622	P6122	Modular Passive Probe	1.5	10X	100	15 to 35	10	11	≤500	No	No	140.00 ea.



High-Voltage Probes

Highest Performance 100X and 1000X Probes Available

The P5100 100X 10-Foot High-Voltage Probe with Readout includes two cable markers in each of three colors, crocodile clip, adjustment tool, small hooktip, large hooktip, 18" ground lead, 6" ground lead and instruction manual. Model P6009 100X 9-Foot High Voltage Probe with Readout comes with two cable markers in each of three colors, crocodile clip, adjustment tool, small hooktip, large hooktip, 18" ground lead, 3" ground lead, bayonet ground assembly and instruction manual. The P6015A uses an environmentally safe silicone compound for a dielectric and never needs refilling. This 1000X 10-foot High-Voltage Probe includes hook probe tip, banana plug tip, crocodile clip (plugs onto ground lead), ground lead, carrying case and instruction manual. One-year warranty.

High-Voltage Probe Specifications

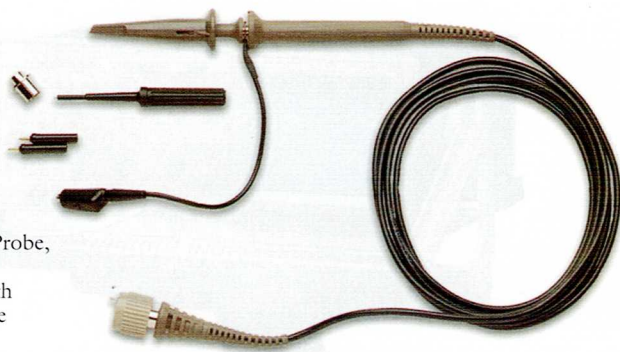
Stock No.	Part No.	Description	Nominal Length (Feet)	Attenuation	Bandwidth (MHz)	Rise Time (ns)	Loading	Comp. Range PicoFarads (pF)	Maximum Voltage DC+pk AC (V)	Readout	Price
220X510	P5100	High-Voltage Probe	10	100X	250	1.75	10 MΩ/2.75 pF	7 to 30	2.5 kV	Yes	\$ 199.00 ea.
220X549	P6009	High-Voltage Probe	9	100X	120	2.9	10 MΩ/2.5 pF	8 to 47	1.5 kV	Yes	455.00 ea.
220X560	P6015A	High-Voltage Probe	10	1000X	75	4.0	100 MΩ/3 pF	7 to 49	40 kV	No	1050.00 ea.



Passive Voltage Probes

High Quality and Durability

Model P6101B 1X 15-MHz Passive Probe includes four pairs of colored cable markers, retractable hook tip, 6" ground lead, two replacement probe tips, BNC to probe tip adapter, adjustment tool, storage pouch and instruction manual. P6103B 10X 60-MHz Probe, P6109B 10X 100-MHz Probe with Readout, P6111B 10X 200-MHz Probe, P6119B 1X/10X 10/100-MHz Switchable Probe and P6129B 1X/10X 10/100-MHz Probe with Readout all have the same contents as the P6101B except an instruction sheet replaces the manual. One-year warranty.



Passive Voltage Probe Specifications

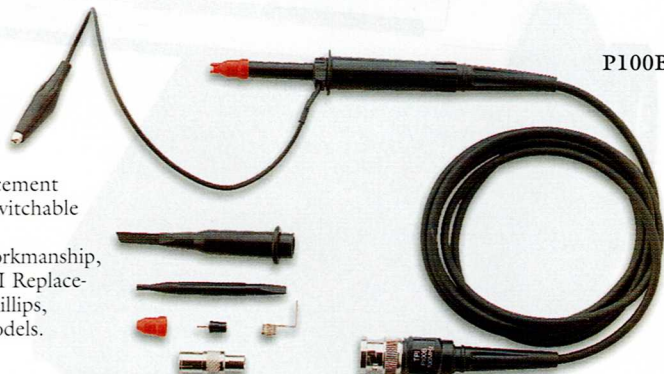
Stock No.	Part No.	Description	Cable Length (Meters)	Attenuation	Bandwidth (MHz)	Comp. Range Picofarads (pF)	System Input Resistance (MΩ)	Typical Input C (pF)	Maximum Voltage DC+pk AC (V)	Readout	Ground Reference	Price
220X571	P6101B	Passive Probe	2	1X	15	N/A	1	100	420	No	No	\$ 65.00 ea.
220X573	P6103B	Passive Probe	2	10X	60	15 to 35	10	13	420	No	No	75.00 ea.
220X589	P6109B	Passive Probe	2	10X	100	15 to 35	10	13	420	Yes	No	90.00 ea.
220X591	P6111B	Passive Probe	2	10X	200	15 to 35	10	14	420	Yes	No	150.00 ea.
220X599	P6119B	Switchable Passive Probe	2	1X/10X	10/100	15 to 35	1/10	100/18	420	No	No	105.00 ea.
220X629	P6129B	Passive Probe	2	1X/10X	10/100	15 to 35	1/10	100/18	420	Yes	No	120.00 ea.

Oscilloscope Replacement Probes

Accommodate Virtually All Oscilloscopes

Oscilloscope users purchase an average of at least five replacement probes during the life of their instruments because probes wear out, burn out, are lost, etc. Many factory original probes are actually inexpensive and often inferior products. For this reason, we are pleased to offer the outstanding quality of TPI's line of replacement probes. Choose from standard repairable, deluxe switchable/repairable and deluxe switchable modular probes.

Manufactured to exacting specifications, these probes are unequalled in quality workmanship, materials and reliability. They are priced 20-40% less than typical factory originals. TPI Replacement Probes accommodate virtually all oscilloscopes including Tektronix, Hitachi, Phillips, Hewlett Packard, Leader, B&K, etc. Choose from P100B, SP100B and M12SWB models.



P100B

Model P100B

Standard Repairable X10 Replacement Probe

Repairable X10 probe features cable with BNC replaceable connectors. It has 15- to 35-pF compensation range and 10-MΩ input impedance. This black X10 direct probe is 1.4 m long with a sharp replaceable tip. Includes insulated tip, spring hook, BNC adapter and IC tip. Ninety-day warranty.

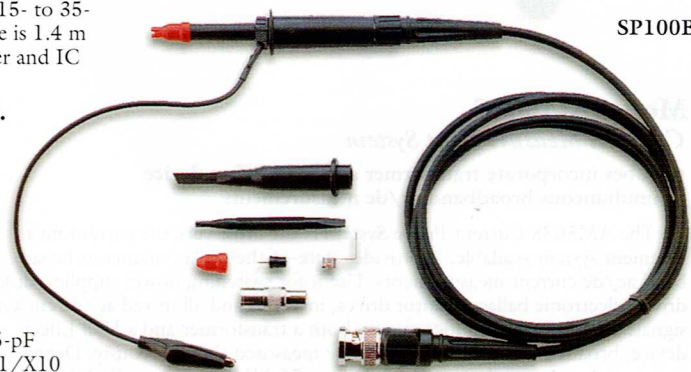
376X325 P100B X10 Std. Probe.....1-11, \$39.00 ea.; 12-up, \$37.00 ea.

Model SP100B

Deluxe X1/X10 Switchable/Repairable Probe

This is one of our most popular oscilloscope replacement probes. Just the flip of a switch converts it from X1 to X10 attenuation (or vice versa), eliminating the need to change probes. It features slender, very flexible cable with BNC replaceable connectors and sharp, replaceable tip. The deluxe model has 15- to 35-pF compensation range and 10-MΩ (X10) input impedance. This black switchable X1/X10 direct probe is 1.4 m long. SP100B includes insulated tip, spring hook, BNC adapter and IC tip. Ninety-day warranty.

376X400 SP100B Deluxe Probe1-11, \$45.00 ea.; 12-up, \$42.50 ea.



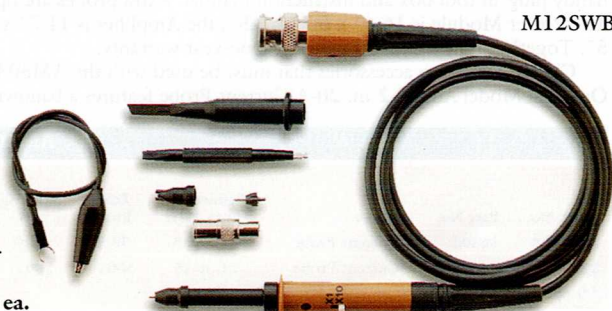
SP100B

Model M12SWB

Deluxe Switchable Modular Probe

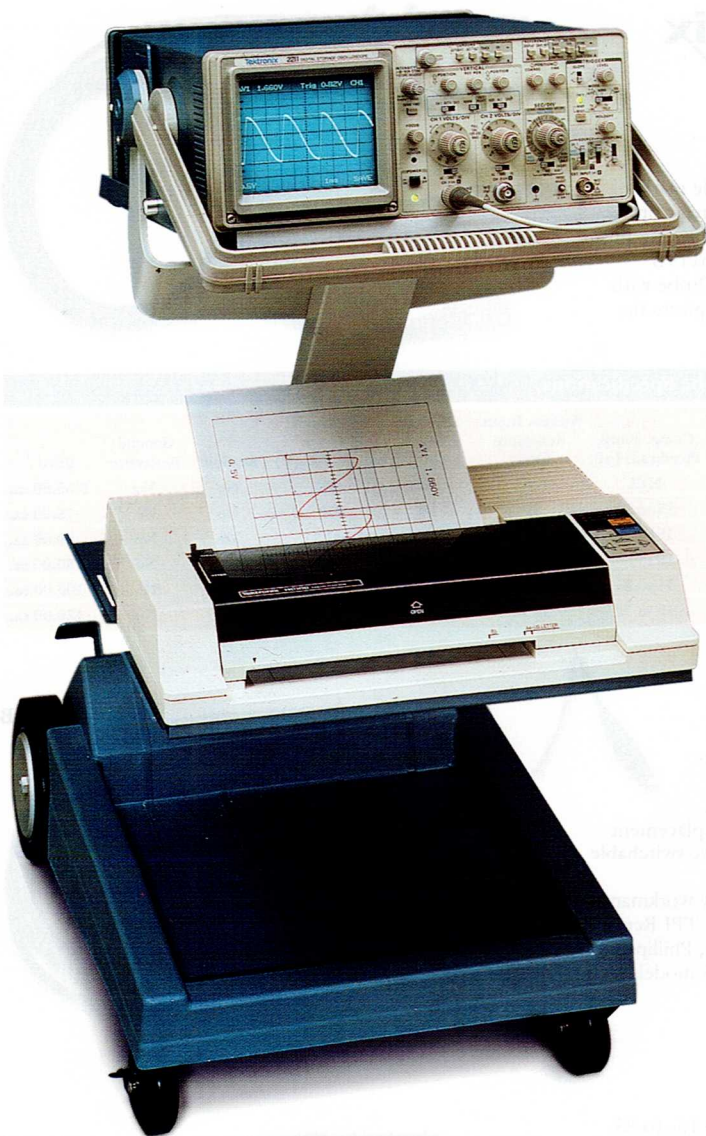
Just the flip of a switch converts our most popular oscilloscope replacement probe from X1 to X10 attenuation (or vice versa), so you don't have to change probes. Not only is this convenient, but it can be quite a cost savings too. M12SWB comes with flexible 1.4-m cable, sprung hook, BNC adapter, insulating tip, spare measuring tip, IC adapter and ground cable. Features 10-MΩ input resistance (X10), full 250-MHz bandwidth, switchable X1/X10 attenuation and 15- to 35-pF nominal input capacitance. Ninety-day warranty.

376X225 M12SWB Deluxe Probe.....1-11, \$74.00 ea.; 12-up, \$69.50 ea.



M12SWB






K212 Portable Instrument Cart

Low Cost Portability

- For all portable instruments
- Sturdy and mobile platform
- Enhances sharing and work space
- Tilttable top tray
- Locking front casters
- Four-outlet U.S. power strip option

Model K212 Portable Instrument Cart is designed for efficient system management and work space use. It is ideal for transporting oscilloscopes and other portable instruments. This sturdy cart features column and trays made from high-strength aluminum so you can transport your instruments with confidence. Its base is constructed of thermoset polyester.

The K212 features a tilttable top tray, locking front casters, two 1" x 5' securing straps, retaining bar and probe holders. It includes an easy-to-follow instruction sheet. Dimensions are 17" overall cart width, 16" shelf width, 33" overall cart height, 21.6" overall cart depth and 14" shelf depth. The K212 weighs 20 pounds. One-year warranty.

An optional package makes the K212 cart even more efficient. Option 22 includes a four-outlet power strip and an extra tray so you can transport extra equipment on the same cart. *Shipped surface freight only.* 

K212 Portable Instrument Cart

220X412 1-2, \$435.00 ea.; 3-up, \$418.00 ea.

K212 OPT-22 Port. Inst. Cart w/ Option 22 (Power Strip and Tray)

220X416 1-2, \$600.00 ea.; 3-up, \$576.00 ea.

Model AM503S

Current Measurement System

- Probes incorporate transformer and Hall Effect device
- Simultaneous broadband ac/dc measurements

The AM503S Current Probe System is the most versatile current measurement system available. It provides state-of-the-art simultaneous broadband ac/dc current measurements. Use it for switching power supplies, disk drives, electronic ballasts, motor drives, inverters and all mixed ac/dc current signals. Since the probes incorporate both a transformer and a Hall Effect device, broadband ac/dc current can be measured simultaneously. Depending on the probe used, current from dc to 50 MHz and up to 700 A can be measured by clipping the split-core probes around the conductor.

Model AM503S is truly a system consisting of TM 502A two-wide Power Module, plug-in AM503B Current Probe Amplifier, A6302 Current Probe, handy plug-in tool box and instruction manual. Extra probes are optional. The Power Module is 16.6" x 5.7" x 5.5"; the Amplifier is 11.7" x 2.7" x 5". Together they weigh 13 pounds. One-year warranty.

Choose from two accessories that must be used with the AM503S.

Optional Model A6302 2-m, 20-A Current Probe features a bandwidth (Hz

to MHz) of dc to 50 MHz. It includes a continuous pulse of 20 A with a peak point of 50 A and a split core. The A6302 clips on to conductors up to .15" in diameter. Includes 5" ground lead, 3" ground lead, two miniature alligator clips and instructions.

Optional Model A6303 is a 2-m, 100-A Current Probe with a bandwidth (Hz to MHz) of dc to 15 MHz. It features a continuous pulse of 100 A with a peak point of 500 A and a split core. The A6303 clips on to conductors up to .83" in diameter. It includes carrying case and instructions.

220X140 AM503S Current Measurement System \$3095.00 ea.

220X128 Optional A6302 20-Amp Current Probe \$850.00 ea.

220X130 Optional A6303 100-Amp Current Probe \$1595.00 ea.



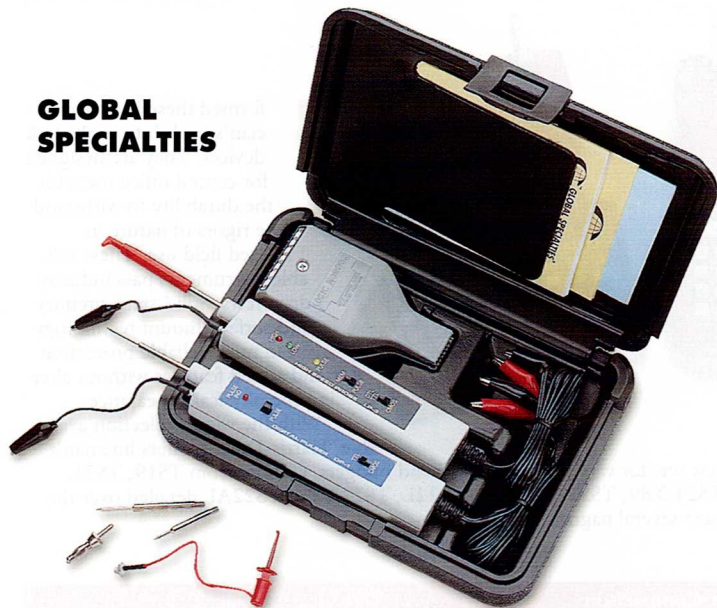
AM503S Accessory Specifications

Stock No.	Part No.	Name	Bandwidth Hz to MHz	Peak Pulse	Max AC p-p	Derate Above	Max DC	Amp•S Product	Current/Div Display Range	Rise Time	Insertion Impedance @ 1 MHz	Max Barewire Voltage	Max Conductor Diameter	Cable Length
220X128	A6302	Current Probe	DC to 50	50 A	40 A	20 kHz	20 A	100 x 10 ⁻⁶	1 mA to 5 A ¹	≤7.0 ns	0.1 Ω	500 V	0.15"	2 m
220X130	A6303	Current Probe	DC to 15	500 A	200 A	20 kHz	100 A	10,000 x 10 ⁻⁶	5 mA to 50 A ¹	≤23 ns	0.02 Ω	700 V	0.83"	2 m

* Scope set to 10 mV/div



GLOBAL SPECIALTIES



LTC-2 High Speed Logical Analysis Test Kit

Model LTC-2 gets your test instrument equipped up to speed in today's fast digital world. This high-speed, high-performance digital test kit is ideal for even the most demanding service, design, testing and troubleshooting applications. Incorporating DP-1 Digital Pulser, LM-1 clip-on Logic Monitor and LP-3 Logic Probe, this kit can capture pulses as narrow as 15 ns at speeds up to 35 MHz. All instruments are circuit powered and need no external power source. Instrument package includes adapters and accessories in a custom-fitted high-impact plastic case. Useful accessories include two 1.5" probe tips, two 2.5" probe tips, 3" quick-hook jumper, two 3" alligator clip cords with alligator clips and a complete set of instruction manuals. The 1.5-pound kit is 8.5" x 6" x 2.5". One-year warranty.

190X200 LTC-2 Logic Test Kit.....1-5, \$199.00 ea.; 6-up, \$189.00 ea.

LTC-8 Deluxe Logic Test Kit

LTC-8 features multi-family logic capability to speed up troubleshooting. This circuit-powered test kit is ideal for field service and educational use. It is necessary for anyone who designs, troubleshoots, repairs or tests digital circuitry. Applications include troubleshooting all CMOS/TTL digital circuits such as counters, A/Ds, D/A's, microprocessors, Flip-Flop latches, shift registers, etc. This TTL and CMOS compatible kit monitors hi/lo and pulses.

Designed and packaged as a self-supporting test system, this kit includes all the instruments and accessories you will need for most digital troubleshooting situations. It features LP-5 100-MHz Logic Probe, SQ-1 Tone Ohmmeter, LM-2A Logic Monitor and DP-1 Digital Pulser Probe. Versatile accessories include two interchangeable probe tips, quick hook jumper, three alligator clip ground wires, quick hook adapter and banana plug adapter, making it a hands-free instrument. Kit contents with manuals plus *Digital Troubleshooting Techniques* are packaged in a custom-fitted molded vinyl carrying case. The 1.25-pound kit is 8.5" x 6" x 2.5". One-year warranty.

190X208 LTC-8 Logic Test Kit.....1-5, \$379.00 ea.; 6-up, \$360.00 ea.

LTC-8 Individual Components

LP-5: This circuit-powered logic probe finds pulses even too fast for oscilloscopes, detecting up to 5-ns pulses. LEDs indicate high, low logic states and transitions. Selectable memory latches pulse LED on for transition at input of 5 nsec. Specifications include: pulse width (5 ns), impedance (1 MΩ) and circuit power (5-18 V dc). The 3-ounce unit is 6" x 1" x .7". Includes instruction manual.

190X130 LP-5 Logic Probe.....1-11, \$99.00 ea.; 12-up, \$94.00 ea.

SQ-1: Use this shortsqueek tone ohmmeter for tone shifts of 1200-1400 Hz. Locate bad ICs and circuit shorts without unsoldering parts. Typical range is 1-0.01 Ω. The 12-ounce unit is 7" x 3.5" x 1.5". Includes instruction manual.

190X565 SQ-1 Short Locator.....1-11, \$49.95 ea.; 12-up, \$47.50 ea.

LM-2A: This deluxe logic monitor simultaneously displays the static and dynamic states of 16 logic inputs. It features 16 channels through right angle header, 24-inch mating ribbon cable and 16-pin test clip. The Model LM-2A displays 16 high-intensity LEDs. Threshold mode selectors are TTL (2.3 V dc±0.1 V dc), CMOS (70% V cc±0.2 V dc) and Variable (1.0-9.0 V dc). The 15-ounce unit is 6" x 3" x 1". Includes instruction manual.

190X155 LM-2A Logic Monitor.....1-11, \$175.00 ea.; 12-up, \$166.00 ea.

LTC-2 Individual Components

Global Specialties is the nation's largest supplier of logic-type test equipment for the rapid determination of logic states. Each instrument offers speed and storage capabilities equalled only by the fastest oscilloscopes plus many special advantages for professional users and student technicians. Signal inputs are protected against overvoltages, and power leads are protected from over and reverse voltages.

DP-1: This hand-held pulser probe is a must if you work with digital circuits. It will deliver a single pulse or a 100-Hz pulse train with a pulse current of up to 100 mA. The pulse width varies for TTL or CMOS compatibility (1.5 μs for CMOS). Rise time is less than 100 ns with a fall time of less than 500 ns for TTL and less than 8 μs for CMOS. Model DP-1 is built to last. This pulser can deliver an output pulse into a short circuit indefinitely without damage, and the input is protected to +50 V dc. The 3-ounce unit is 6" x 1" x .7". Includes probe tip and operating instructions.

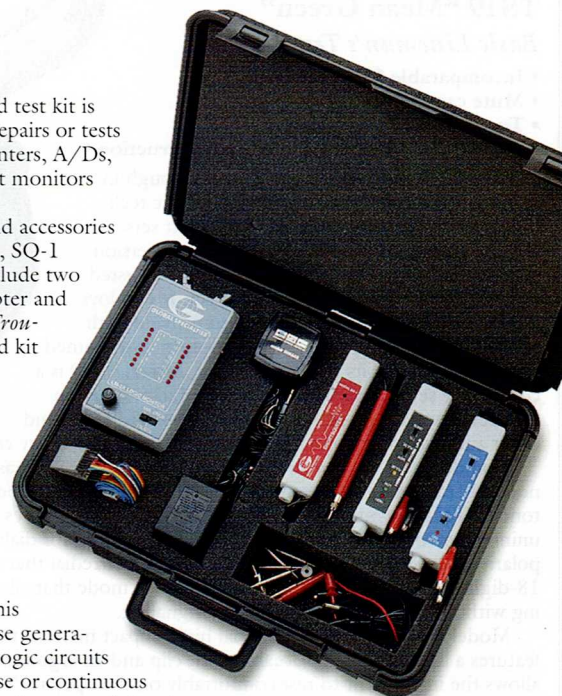
190X250 DP-1 Digital Pulser.....1-11, \$45.00 ea.; 12-up, \$41.50 ea.

LM-1: A clip-on logic monitor, Model LM-1 provides precision and reliability at a value price. It is a low-cost, 16-channel digital tester specifically designed for use with eight-, 14- or 16-pin ICs. This lightweight and easy-to-use logic monitor attaches both mechanically and electronically to IC pins. Sixteen high-brightness LEDs at the top of the unit light for high logic levels and remain off for low levels or unconnected pins. The unique clip design makes it very easy to use. This 3-ounce unit is 4" x 2" x 1.5". Includes operating instructions.

190X150 LM-1 Logic Monitor.....1-11, \$60.00 ea.; 12-up, \$56.00 ea.

LP-3: This high speed probe is your choice if you troubleshoot fast logic systems such as microprocessors and memory circuits. It is a premium troubleshooting tool capable of capturing pulses as narrow as 15 ns or pulse trains to 35 MHz. Model LP-3 is powered from any circuit with an operating voltage of 5-18 V dc. It has switchable TTL or CMOS compatibility plus pulse memory for extra fast pulses. The 3-ounce unit is 6" x 1" x .7". Includes power leads, probe tip, ground lead and operating instructions.

190X100 LP-3 Logic Probe.....1-11, \$45.00 ea.; 12-up, \$41.50 ea.



DP-1: Use this pocket-sized pulse generator to stimulate logic circuits with a single pulse or continuous pulse train. A circuit-powered, hand-held pulser probe, DP-1 is a must if you work with digital circuits. It will deliver a single pulse or a 100-Hz pulse train with a pulse current of up to 100 mA. The pulse width varies for TTL or CMOS compatibility: 1.5 μs for CMOS. Rise time is less than 100 ns with a fall time of less than 500 ns for TTL and less than 8 μs for CMOS. Like all Global products, Model DP-1 is built to last. This pulser can deliver an output pulse into a short circuit indefinitely without damage, and the input is protected to +50 V dc. The 3-ounce unit measures 6" x 1" x .7". Includes probe tip and operating instructions.

190X250 DP-1 Digital Pulser.....1-11, \$45.00 ea.; 12-up, \$41.50 ea.



Hand-Held Lineman's Test Sets

Dependable Selection of Portable Test Equipment

For over three decades, Harris-Dracon has been recognized as the industry leader in quality telephone test sets and accessories. Each dependable product is backed by a history of reliability. Hand-held lineman's test sets are ideal for telephone companies, MIS managers, OSP technicians and CO personnel. Comfort, reliability and a proven track record have made them the number one choice of more technicians.

The innovator in portable test equipment, Harris-Dracon has led the way in butt-in test technology since pulse and tone features were combined into one single unit over three decades ago. Improved functionality has trans-



formed these basic technician's tools into multi-task devices. They are designed for central office use with the durability to withstand the rigors of nature in rugged field use. These reliable instruments pass industry drop tests. Solid-state circuitry and surface-mount technology mean more reliable protection and added features without altering the physical appearance.

With the widest selection available, Harris-Dracon offers lineman's test sets for varying applications and budgets. Choose from TS19, TS21, TS21-X89, TS22, TS22DS, TS22L, TS22A and TS22AL detailed over the next several pages.

Lineman's Test Set Comparison

	TS19	TS21	TS21-X89	TS22	TS22DS	TS22L	TS22A	TS22AL
Last Number Redial	✓	Pulse	Pulse	✓	✓	✓	✓	✓
RainSafe™			✓	✓	✓	✓	✓	✓
Built-in Ringer	✓			✓	✓	✓	✓	✓
Amplified Speaker				✓	✓	✓	✓	✓
Recall Memory				✓	✓	✓	✓	✓
DataSafe™	✓				✓	✓	✓	✓
Speaker Phone							✓	✓
Digital Signal Detection						✓		✓
Data Present Warning Tone						✓		✓
Price Each	\$133.00	\$210.00	\$220.00	\$297.00	\$297.00	\$329.00	\$387.00	\$419.00

TS19 "Mean Green"

Basic Lineman's Test Set

- Incomparable \$125 price!
- Mute capabilities
- Tone and pulse operation
- Famous Harris-Dracon quality construction

The TS19 represents a price breakthrough in lineman's test sets. By using the same basic technology as its industry-standard TS21 butt sets, Harris-Dracon is now able to offer a basic version test set that incorporates all of the most requested features in a low-cost lineman's test set. It employs the latest integrated circuit design to provide both DTMF (touch-tone) and/or pulse output. Nicknamed "Mean Green" for its distinctive color, Model TS19 is a completely self-contained, line-powered, combination handset especially made for installers, in-house repair and other authorized personnel for line testing and temporary communications.

And don't let the low price fool you. Dracon's TS19 has all the features normally required to perform all basic telecom functions. Features include tone (DTMF) or pulse operation, talk/monitor capabilities that allow both uninterrupted monitoring or an off-hook condition for dialing and talking, polarity that tests for Tip and Ring, last-number redial that remembers up to 18-digits in tone or pulse mode and monitor mode that allows line monitoring without disrupting voice, data or signaling.

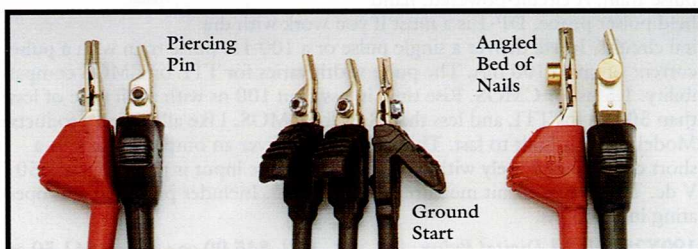
Model TS19 is made of a special high-impact material that resists damage, features a heavy-duty (replaceable) belt clip and an ergonomic design that allows the instrument to rest comfortably on the operator's shoulder.



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The TS19 measures 2.5" x 2.5" x 8.5" and weighs only about a pound. It includes field-replaceable belt clip, standard (modular) 5-foot cordset terminated with universal banana jacks plus standard slide-on alligator clips. Modular design allows for a variety of optional cordsets to be used with the TS19 easily — see below. Comes with eighteen-month warranty.

TS19 (19800-003) Test Set, Basic Version	
350X250	1-9, \$133.00 ea.; 10-up, \$125.00 ea.
P1980-001 Modular to Piercing Pin Cordset	
350X980	\$28.00 ea.
P1980-007 Modular to Ground Start Cordset	
350X984	\$46.00 ea.
P1980-009 Modular to Angled Bed-Nails Cordset	
350X986	\$33.00 ea.



Model TS21

Lineman's Test Set

- The industry standard packed with popular features
- Offers the latest in integrated circuit design

Harris-Dracon's TS21 Test Set used by most major communications companies worldwide is the industry standard by which all others are compared. It employs the latest in integrated circuit design to provide DTMF (touch tone) or dial pulse output with the flip of a switch, so it's compatible with any central office.

Features line-powered operation so no external power is required unless operating on low voltage or dry circuits. Polarity LEDs provide immediate visual indication for tip/ring polarity. Talk monitor switch establishes offhook condition for dialing or talking in the "T" position and line-monitoring function in the "M" position without disruption. Mute switch eliminates sidetones and is useful in noisy environments. Redial in Pulse Mode lets you place last number dialed in redial for at least 2 minutes. The reliable TS21 meets or exceeds all Telco environment standards for temperature and humidity. It passed the industry standard 25-foot drop test.

This 1.5-pound model measures 10" x 3" x 3.4". Includes field-replaceable belt clip. Choose from two versions. The Standard version utilizes standard alligator-type clip leads while the Ground-Start version utilizes a third conductor (green) which is connected to ground. Each cord is terminated to an alligator-style clip. Pressing the test set's ground-start button connects the ground conductor inside the unit. Eighteen-month warranty.

21800-081 TS21 Test Set, Standard Version

350X321.....1-5, \$209.00 ea.; 6-up, \$197.00 ea.

21800-087 TS21 Test Set, Ground-Start Version

350X327.....1-5, \$219.00 ea.; 6-up, \$206.00 ea.

Model TS21-X89

Water-Resistant Lineman's Test Set

- Extra protection against severe weather conditions
- Coated circuit board, rubber keypad and sealed switches

Several unique features make the TS21-X89 the most water-resistant TS21 version. A specially coated circuit board, rubber keypad and sealed switches provide extra protection from severe weather conditions. In addition, it provides all standard TS21 features listed above. The latest in integrated circuit design supplies DTMF (touch tone) or dial pulse output with the flip of a switch. Other features include line-powered operation, polarity LEDs, talk monitor switch, mute switch and redial in Pulse Mode. The TS21-X89 passed the industry standard 25-foot drop test.

This 1.5-pound test set measures 10" x 3" x 3.4". Includes field-replaceable belt clip and 5-foot cordset equipped with angled bed-of-nails alligator-type clips. Eighteen-month warranty.

21800-X89 TS21 Test Set, Water-Resistant Version

350X329.....1-5, \$219.00 ea.; 6-up, \$206.00 ea.

Model 21800-084

"C.O." Version Lineman's Test Set

- Reliable version for central office environment
- Solid-state circuitry for better protection against high current levels

A special version of Harris-Dracon's very popular TS-21 Test Set, this reliable model is designed for working in a central office environment. It features line-powered operation, polarity LEDs and talk monitor switch. Mute switch eliminates sidetones and is useful in noisy environments. Redial in pulse mode allows for last number redial for at least 2 minutes. Reduced monitor mode impedance provides improved monitor level. New solid-state circuitry supplies better protection against high current levels found in C.O.s. It is also very useful where a variety of cord types might be needed.

This 1.5-pound test set is 10" x 3" x 3.4". Includes field-replaceable belt clip and 1-foot cord terminated with a 346A male plug. Five optional cordsets terminated with mating 471A female plugs may be utilized. Mating cords must be purchased separately. Eighteen-month warranty.

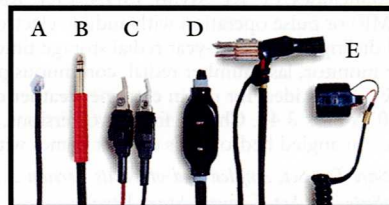
350X324 TS21 Test Set, "C.O." Version

21800-084.....1-5, \$214.00 ea.; 6-up, \$202.00 ea.

Optional TS-21 Cordsets

- | | | |
|------------|---|-------------|
| A. 338X096 | L2W96AX 5' w/ Modular Jack Plug..... | \$33.00 ea. |
| B. 338X038 | L2W38AX 5' w/ 310-Type Phone Jack..... | 45.00 ea. |
| C. 338X098 | L2W98AX 5' w/ Dual Alligator Clips..... | 44.00 ea. |
| D. 338X039 | L2W39AX 5' w/ 240A Test Plug (1200-Ω Switch)..... | 78.00 ea. |
| E. 338X200 | 087-7218006-118 20' Extension w/ 346A Plug..... | 45.00 ea. |

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Model TS22®

Test Set with Built-in Amplified Speaker

- Hands-free internal speaker
- Telephone number storage
- Higher digit capacity
- Last-number redial

Model TS22 offers features and advantages not found on any other test set. The unique built-in amplified speaker provides two audio levels for hands-free listening and use with computerized voice response systems. A special time-out circuit allows for extended battery life. Multiple memories enable storage of nine 18-digit telephone numbers in repertory dialer (speed dialing) for easy access to test board, C.O., voice response systems and other frequently called numbers. Tone and pulse modes offer last-number redial. Meeting or exceeding all TS21 specifications, this model offers the unbeatable combination of reliability and expanded utility.

The TS22 is line powered for talk, monitor or dialing functions. It has a locking mute switch to eliminate side tone in noisy areas, continuous polarity indication LEDs and high voltage protection against station carrier. Other features include PBX pause button, maintenance-free 3-V lithium battery for indefinite memory storage, moisture-resistant housing for severe weather conditions and rubber non-slip shoulder rest for hands-free operation.

At 1.5 pounds, this model measures 10" x 3" x 3.4". The speaker is powered by a 9-volt battery. Includes field replaceable belt clip. Choose from three TS22 versions. The Standard model uses standard alligator-type clips while the Ground-Start version includes a third ground start cord (36") that attaches by way of a banana jack to the standard test set cord. A ground-start line seizure is thereby activated by momentarily touching the end of this third cord to a system ground, resulting in a dial tone. The -009 includes angled bed-of-nails cordset. Eighteen-month warranty.

350X400 22800-001 TS22 Test Set, Standard Version1-5, \$297.00 ea.; 6-up, \$279.00 ea.
350X410 22800-007 TS22 Test Set, Ground-Start Version1-5, 297.00 ea.; 6-up, 279.00 ea.
350X415 22800-009 TS22 Test Set, Angled Bed-of-Nails Version1-5, 297.00 ea.; 6-up, 279.00 ea.



Model TS22®DS

DataSafe™ Test Set

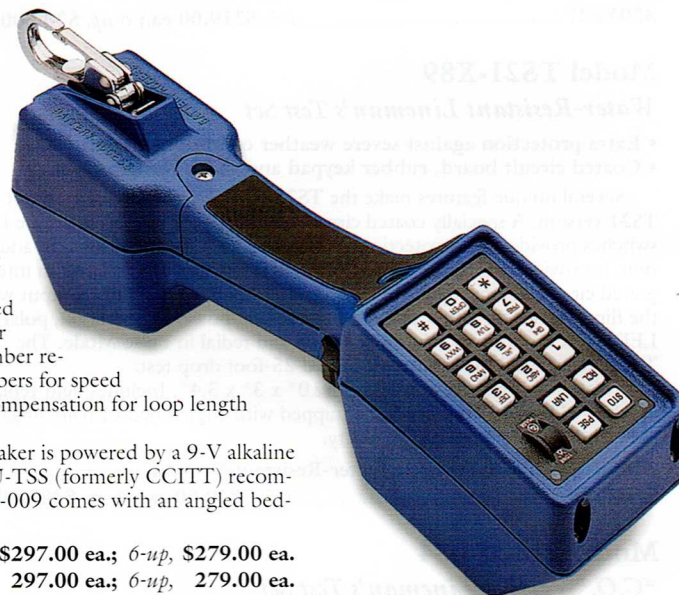
- High-impedance monitor
- Amplified speaker
- The most rugged DataSafe butt-in test set available

As digital lines become more prevalent, operating with DataSafe™ test equipment that won't disturb the data stream is essential. The TS22®DS high-impedance monitor prevents you from interrupting data flow when you clip on to a DSO or DS1 data circuit. You get reduced trouble calls and improved customer satisfaction. This is the most rugged DataSafe butt-in test set available. It includes RainSafe™ operation for use in extreme weather conditions and greater than 20-foot DropSafe™ durability.

In addition, the TS22DS has all the features of the TS22. An easy-to-use amplified speaker provides increased productivity by letting you keep working while waiting for callbacks or assistance. Other features include tone and pulse operation plus last-number redial and audible electronic ringer for callbacks. The test set stores nine 18-digit numbers for speed dialing, has PBX pause button and locking mute switch. It provides DTMF signal compensation for loop length and continuous polarity indicator.

Weighing 1.5 pounds, the TS22DS measures 10" x 3" x 3.4". The amplified speaker is powered by a 9-V alkaline battery. Includes field replaceable belt clip. Choose from two versions that meet ITU-TSS (formerly CCITT) recommendations and Bellcore specifications. The -007 includes ground-start cordset; the -009 comes with an angled bed-of-nails cordset. Eighteen-month warranty.

350X460 22802-009 TD22DS DataSafe Test Set, Angled Bed-of-Nails Cord1-5, \$297.00 ea.; 6-up, \$279.00 ea.
350X457 22802-007 TD22DS DataSafe Test Set, Ground-Start Version1-5, 297.00 ea.; 6-up, 279.00 ea.



Model TS22®L

DataSafe™ Test Set with Amplified Speaker

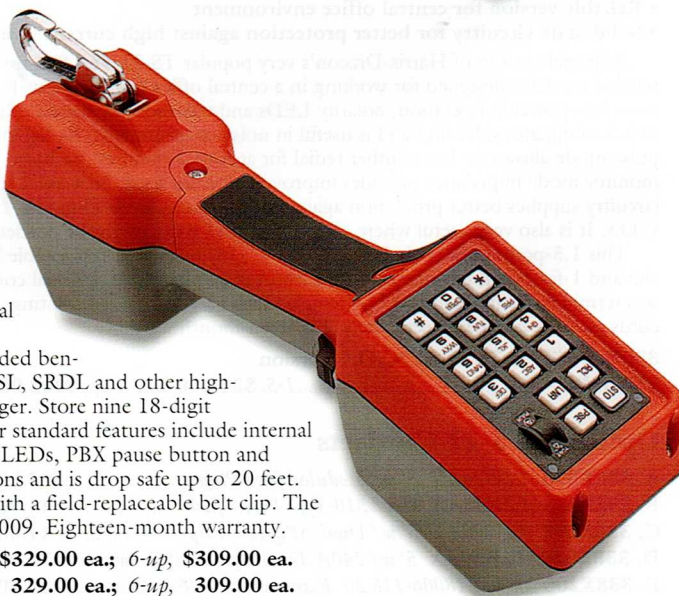
- Internal amplified speaker
- Detects high-speed digital signals when connected to a data line
- Warning tone emitted in talk mode when data is present
- Test set is prevented from going off hook on data line
- High-impedance monitor doesn't interrupt data in monitor mode

A new breed of Harris-Dracon test sets has come to the rescue with the ability to detect high-speed digital signals when connected to a data line — whether 56 kilobits per second (Kbps), 64 Kbps, 1.544-megabits per second (Mbps), etc. The DataSafe™ TS22®L test set audibly indicates if you have clipped onto a data line. It also prevents the technician from going off hook and drawing current from the digital line, should it accidentally try to get dial tone.

Model TS22L functions much the same way as any standard butt-set with the added benefit of data detection. Data detected includes T1, E1, SW56, ISDN, PR1, BRI, HDSL, SRDL and other high-frequency data. Choose tone (DTMF) or pulse operation with audible electronic ringer. Store nine 18-digit numbers in repertory dialer (speed dialing) with three-year redial storage time. Other standard features include internal amplified speaker, high-impedance monitor, last-number redial, continuous polarity LEDs, PBX pause button and locking mute switch. This RainSafe™ unit is ideal for use in extreme weather conditions and is drop safe up to 20 feet.

At 1.5 pounds, the TS22L is 10" x 3" x 3.4". Choose from two versions, each with a field-replaceable belt clip. The -007 includes ground-start cordset. An angled bed-of-nails cordset comes with the -009. Eighteen-month warranty.

350X478 22803-009 TS22L DataSafe Test Set, Angled Bed-of-Nails Version1-5, \$329.00 ea.; 6-up, \$309.00 ea.
350X471 22803-007 TS22L DataSafe Test Set, Ground-Start Version1-5, 329.00 ea.; 6-up, 309.00 ea.



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Model TS22A®

The First True Speakerphone Test Set

- Deluxe, amplified speaker capabilities
- High-capacity memory dialer
- Tone or pulse dialing
- Switchable electronic ringer

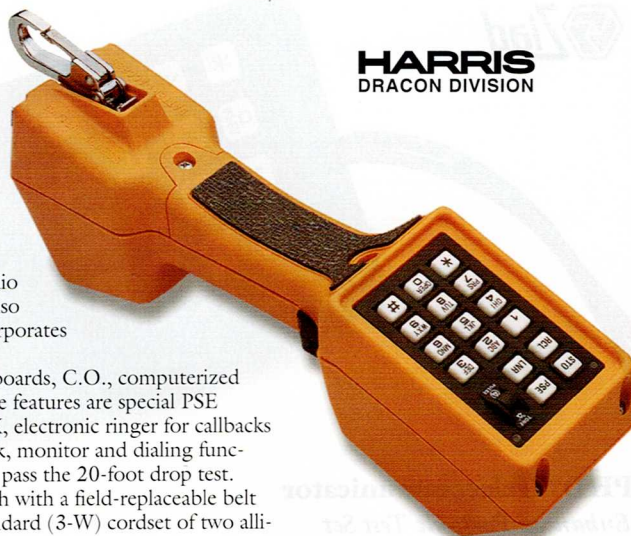
Harris-Dracon's fourth-generation test set is a winner! The state-of-the-art TS22A Lineman's Test Set is the industry's first truly hands-free instrument that incorporates a built-in speakerphone for two-way communications. This innovation allows a technician to continue working — even while talking or gathering information — all hands free!

Model TS22A provides all the features of the popular TS22 including tone or pulse dialing, last-number redial, polarity indication, mute, high-voltage protection, indefinite memory storage and much more. Its SpeakerPhone™ technology not only allows two audio levels for hands-free communication (and use with computerized voice response), but it also works with ANI/ANA on C.O. frame applications. The line-powered SpeakerPhone incorporates an extended-life 9-volt battery with a special time-out circuit for the monitor speaker.

Store up to nine 18-digit telephone numbers for speed dialing and easy access to test boards, C.O., computerized voice response systems, MLT, dispatch and other frequently called numbers. Other unique features are special PSE switch that puts a 4-second pause between numbers in memory for dialing through a PBX, electronic ringer for callbacks and specially designed hearing aid-compatible receiver. The TS22A is line powered for talk, monitor and dialing functions. This moisture-resistant unit meets or exceeds all CCITT recommendations and can pass the 20-foot drop test.

At less than 1.5 pounds, this model is 10" x 3" x 3.4". Choose from two versions, each with a field-replaceable belt clip. The Standard version includes the industry-preferred angled bed-of-nails cord. A standard (3-W) cordset of two alligator clips and one banana jack is supplied with the Ground-Start version. Eighteen-month warranty.

350X450 22801-009 TS22A Test Set, Standard Version1-5, **\$387.00 ea.;** 6-up, **\$364.00 ea.**
350X445 22801-007 TS22A Test Set, Ground-Start Version1-5, **387.00 ea.;** 6-up, **364.00 ea.**



HARRIS
DRACON DIVISION

Model TS22®AL

DataSafe Speakerphone Test Set

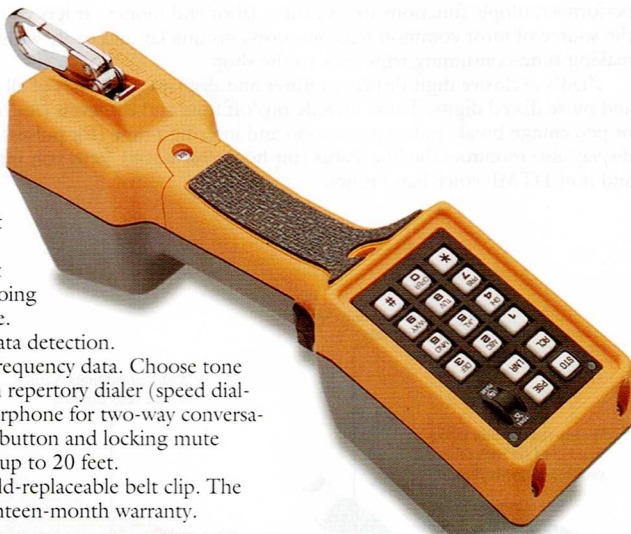
- Hands-free speakerphone feature for two-way conversation
- Detects high-speed digital signals when connected to a data line
- Warning tone emitted in talk mode when data is present
- Test set is prevented from going off hook on data line
- High-impedance monitor doesn't interrupt data in monitor mode

A new breed of Harris-Dracon test sets has come to the rescue with the ability to detect high-speed digital signals when connected to a data line — whether 56 kilobits per second (Kbps), 64 Kbps, 1.544-megabits per second (Mbps), etc. The DataSafe™ TS22®AL test set audibly indicates if you have clipped onto a data line. It also prevents the technician from going off hook and drawing current from the digital line, should it accidentally try to get dial tone.

Model TS22AL functions much like any standard butt-set with the added benefit of data detection. Data detected includes T1, E1, SW56, ISDN, PRI, BRI, HDSL, SRDL and other high-frequency data. Choose tone (DTMF) or pulse operation with audible electronic ringer. Store nine 18-digit numbers in repertory dialer (speed dialing) with three-year redial storage time. Other standard features include hands-free speakerphone for two-way conversation, high-impedance monitor, last-number redial, continuous polarity LEDs, PBX pause button and locking mute switch. This RainSafe™ unit is ideal for use in extreme weather conditions and is drop safe up to 20 feet.

At 1.5 pounds, TS22AL is 10" x 3" x 3.4". Choose from two versions, each with a field-replaceable belt clip. The -007 includes ground-start cordset; the -009 comes with angled bed-of-nails cordset. Eighteen-month warranty.

350X480 22804-007 TS22AL Test Set, Ground-Start Version1-5, **\$419.00 ea.;** 6-up, **\$394.00 ea.**
350X483 22804-009 TS22AL Test Set, Angled Bed-of-Nails Version1-5, **419.00 ea.;** 6-up, **394.00 ea.**



Model TS22®AL-004

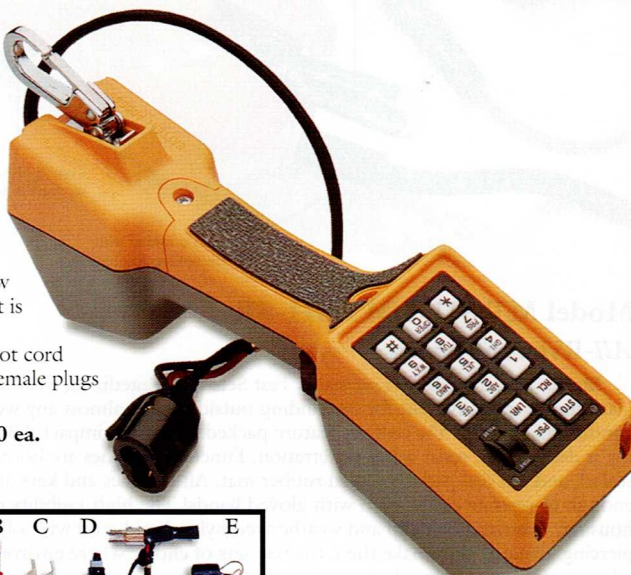
"C.O." Version Lineman's Test Set

- Reliable version for central office environment
- Solid-state circuitry for better protection against high current levels

This special version of Harris-Dracon's popular TS-22 Test Set is designed for working in a central office environment. Model TS22AL-004 features line-powered operation, polarity LEDs and talk monitor switch. Mute switch eliminates sidetones and is useful in noisy environments. Redial in pulse mode allows for last number redial for at least 2 minutes. Reduced monitor mode impedance provides improved monitor level. New solid-state circuitry supplies better protection against high current levels found in C.O.s. It is also very useful where a variety of cord types might be needed.

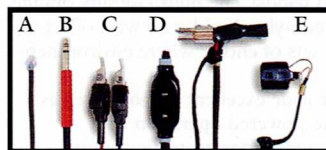
This 1.5-pound test set is 10" x 3" x 3.4". Includes field-replaceable belt clip and 1-foot cord terminated with a 346A male plug. Five optional cordsets terminated with mating 471A female plugs may be utilized. Mating cords must be purchased separately. Eighteen-month warranty.

350X474 22804-004 TS22AL Test Set, "C.O." Version.1-5, **\$419.00 ea.;** 6-up, **\$394.00 ea.**



Optional TS-21 Cordsets

A. 338X096 L2W96AX 5' w/ Modular Jack Plug**\$33.00 ea.**
B. 338X038 L2W38AX 5' w/ 310-Type Phone Jack**45.00 ea.**
C. 338X098 L2W98AX 5' w/ Dual Alligator Clips**44.00 ea.**
D. 338X039 L2W39AX 5' w/ 240A Test Plug (1200-Ω Switch)**78.00 ea.**
E. 338X200 087-7218006-118 20' Extension w/ 346A Plug**45.00 ea.**





PHD™ Telecommunicator

Enhanced Portable Test Set

The PHD Telecommunicator is an enhanced test set that integrates the most common test equipment into a single compact, portable device. You get all the features provided by an ordinary butt-set with a hands-free monitoring device, dB meter and digital multimeter. This state-of-the-art test set performs multiple functions to save time, labor and money. It lets you locate the source of most common telecom problems quickly and easily without making time-consuming trips back to the shop.

Ziad's exclusive digit display captures and displays the values of all tone and pulse dialed digits. These include on/off time and dB levels (for tones) or percentage break, pulses per second and interdigit time (for pulses). Digit display also monitors the line status (on-hook/off-hook), zero volt intervals and non-DTMF voice band tones.

The 24-ounce unit is housed in a high-impact ABS plastic case. It measures 10.25" x 3.25" x 1.5" and comes in a 12" x 8" x 4" carrying case. Includes 5-foot test leads with 66 block clips, four 1.5-volt dc AA batteries and one type 3AG ¼-amp fuse. Ninety-day warranty.

385X500 PHD Test Set.....1-9, \$539.00 ea.; 10-up, \$515.00 ea.



Model MT 811-5/MT 811-5R

All-Weather Test Sets

Metro Tel's affordable Lineman's Test Sets are ruggedized, weatherized instruments specially built for demanding outside use in almost any weather condition. They are low cost yet feature packed. The high-impact ABS housing is designed to resist water penetration. Function switches are booted and sealed, and the dial pad is a sealed rubber mat. All switches and keys are large enough to operate easily, even with gloved hands! The high-visibility orange housing, oversized belt clip and weatherized nylon braid cord with offset piercing alligator clips make these the test sets of choice where environmental extremes are concerned.

Models MT 811-5 and MT 811-5R provide excellent audio as well as many additional features. They include line-powered operation with tone/pulse dialing, talk/monitor, overvoltage carrier protection, mute,

polarity indicator plus both loop and ground start capability. For extra convenience, you get nine speed-dial memories of 18 digits (including the * and #) with both storable pauses and last number redial (tone or pulse). Using a full 16-key dial pad means extra function keys allow it to be modified to meet your special test requirements.

Order MT 811-5 for the standard model. The MT 811-5R includes a ringer for call backs. Each unit includes a no-maintenance lithium battery to protect the memory for almost an unlimited amount of time plus a standard cordset. One-year warranty.

610X150 MT-811-5 Test Set1-9, \$159.00 ea.; 10-up, \$149.00 ea.
610X165 MT-811-5R Test Set1-9, 184.00 ea.; 10-up, 173.00 ea.



Model UTS-E Standard All-Weather Butt-in Test Set

Choose Model UTS-E for long life, high features and yet low cost. This standard test set is now better, lighter, more balanced and tougher. Designed to take punishment, it survives a 20-foot (6-meter) drop onto concrete. It features a waterproof and dust-proof IP64-sealed housing. A unique permanent rubber seal keeps the electronics dry for life — even in the heaviest rain. You can drop Model UTS-E into deep water, and it will float. Because of its high chemical resistance, you can pour strong chemicals all over it, and it will survive.

Place the UTS-E on your shoulder, and you'll be convinced that it just feels right. In addition to its durability, you will enjoy the comfort and convenience of no bumps, no corners and no slipping. You will appreciate the clear transmission, no crackle, no hiss, no old-fashioned carbon mike. Plug into any circuit with confidence. The super-high monitor impedance is both data and digital safe.

Impressive features include strong quick-change line cord, unique wrap-around rubber grip and big keypad with wide spacing. Choose from talk, monitor and on-hook modes. This test set includes tone/pulse with tone priority, 24-digit 10-number memory, redial and timed-break-recall (100 msec) for PABX use. It contains polarity test red/green LEDs, mute and microphone cut-off plus two-tone ringer (sounder). Cord changes are quick and easy with separate hatch cover.

Model UTS-E specifications include monitor impedance (>300 k Ω), max line length (>2500 Ω) and minimum current (<15 mA). ISO 9001 quality is assured.

This butt-in test set includes angled bed-of-nails and spike alligator clips, large belt clip with hanging loop and two-year battery. The 15-ounce unit measures 9.5" x 2.5" x 2.75". Two-year warranty.

UTS-E Test Set
007X1241-5, \$235.00 ea.; 6-up, \$221.00 ea.

Model UTS-ELS Deluxe All-Weather Butt-in Test Set

If you're waiting for an answer or test result, now you can have both hands free to work. Just shoulder place Model UTS-ELS, the most comfortable test set around. To move around, a listen-in facility for talk or monitor modes resolves the line cord length limit. The amplified output with two volume settings is loud and clear enough to be heard even in high-noise areas.

This user-friendly butt-in test set endures daily punishment for long life. It survives a 20-foot (6 m) drop on concrete, floats in water and resists strong chemicals. With no bumps, corners or slipping, it feels right on your shoulder. Appreciate the clear transmission, no crackle, no hiss, no old-fashioned carbon mike. Plug into any circuit with confidence. Super-high monitor impedance is both data and digital safe in handset or loudspeaker mode.

Lineman's Test Set Comparison			
	UTS-E	UTS-ELS	UTS-3
Data Safe	✓	✓	✓
Loudspeaker Listening in Talk or Monitor Mode		✓	
Hands-Free Two-Way Speaker Phone			✓
Ten-Number Memory (24 Digits)	✓	✓	✓
Two-Tone Ringer	✓	✓	✓
Volume Boost	✓	✓	✓
Line Powered	✓	✓	✓
Waterproof	✓	✓	✓

Features quick-change line cord, rubber grip and big keypad with wide spacing. Choose talk or monitor with loudspeaker and volume boost or on-hook mode. Includes tone/pulse with tone default, 24-digit 10-number memory, redial and time-break-recall (100 msec) for PABX use. Contains polarity test red/green LEDs, mute and microphone cut-off, two-tone ringer (sounder) and separate cord compartment.

UTS-ELS has the same specifications, contents, weight and dimensions as UTS-E except the battery lasts 25 hours. Two-year warranty.

UTS-ELS Test Set
007X2531-5, \$275.00 ea.; 6-up, \$259.00 ea.

Model UTS-3 All-Weather Hands-Free Butt-in Test Telephone

You no longer need to hold onto your butt-in test telephone when you're busy. Put it down or hang it up, and talk as if you were using the handset. You get crystal clear speech with no clipped words and high loudspeaker output with the easy, reliable UTS-3. Both microphone and speaker face you. You get full performance at any line length in either handset or hands-free mode. It even compensates for background noise.

This light, balanced, contoured instrument survives the 20-foot (6-m) drop test, floats in water and is unaffected by common chemicals. The easy-to-operate UTS-3 is better conceived, better engineered and a pleasure to use. Includes easy-change line cord with no circuit access, molded wrap-around rubber grip for reliable shoulder placement plus big black on white keypad buttons with high visibility and wide spacing. You get top-quality transmission in hands-free or handset operation modes plus high loudspeaker output with boost control. Hands-free adapts to background noise level with soft clipping for low distortion. Monitor is data and digital safe.

Features tone/pulse with tone default, 10 24-digit memories plus redial, two-tone warble ringer and timed break recall (100 msec) for PABX use. Includes polarity test with red and green LEDs, mute with transmitter cut-off and quick, easy cord changes without opening the case. Provides over-current and over-voltage protection plus auto-reset circuit. Protected against raw battery, lightning surge, inductive spikes and electrostatic.

Specifications: high-impedance monitor (>20 k Ω), maximum line length (>2500 Ω both modes), minimum current (<15 mA) and minimum voltage (5.5 V). ISO 9001 quality assured.

Includes durable braided nylon two-wire cord terminated with angled bed-of-nails and spike alligator clips, big strong rustless snap hook plus 45-hour 9-V alkaline battery. The 15-ounce unit is 9.5" x 2.5" x 2.75". Two-year warranty.

UTS-3 Test Set
007X3761-5, \$372.00 ea.; 6-up, \$350.00 ea.

Model UTS-ISDN

Basic Rate ISDN Access Tester

- Line-powered, water-resistant butt set
- Performs self-test and diagnosis
- Two-line by 16-character backlit LCD
- Lightweight, rugged and durable package is designed to survive arduous conditions
- Silicone rubber grip and large belt clip

Chesilvale Electronics' ISDN Basic Rate Access Tester is an all-weather butt-in test telephone. This highly featured and durable product is engineered for long service in the arduous conditions encountered by telecommunications technicians.

Model UTS-ISDN is the ideal test telephone shape. Both keypad and display are positioned to face you. Control keys are sensibly placed in the handle section. An ergonomically designed test telephone, it is truly a handheld, shoulder-placeable and highly water-resistant instrument.

When Set Up mode is selected from the top level menu, you can set the TEI to Auto or Manual, the S bus to 100 Ω or high-impedance termination and select the data test pattern. This tester operates from the S bus line power. If for any reason this supply is unavailable, the internal rechargeable battery will supply the instrument for several hours. If fitted with safety snap, charging is automatic when connected to powered lines. Should the battery fully discharge, you may temporarily replace it with any standard 9-volt alkaline or lithium battery without risk of reverse current charging.

The UTS-ISDN is a functional tester tailored to fit the needs of any technician who is installing, commissioning or maintaining an ISDN basic rate line or terminal equipment. Use it as an ISDN telephone or perform the following tests: self call or end to end loopback B channel transmission quality bit error rate tests, supplementary service operation checks, teleser-

UTS-ISDN Tests

- S/T bus condition
- D channel access
- Layer 1, 2, 3 errors
- Supplementary service
- Speech call
- Teleservice
- B channel bit error



vices and D channel packet access. Two data call modes give you complete flexibility for transmission quality testing.

The two-line, 16-character, dot matrix backlit liquid crystal display shows user menus. Other provided information includes call progress; layer one, two and three error messages; ISDN call clear cause codes and test information. Dialing modes include speech call (overlap dial-

ing), data call (en bloc dialing) and 10 by 21-digit number store with redial. For call set-up, the display is used in conjunction with the control keys located in the tester's handle for easy operation. These function keys include SELECT (choose menu option, dial call and redial), SCROLL (scroll through menu options) and CLEAR (return to top menu and clear call).

At last, a suitably featured and priced ISDN test set is available in a sensible package that is designed to survive. A water-resistant silicone rubber seal gasket protects the unit's electronics. The high-impact plastic case has a comfortable silicone rubber hand/shoulder grip and a convenient large belt clip. This 1.2-pound tester is 240 mm x 71 mm x 85 mm. Two-year warranty.

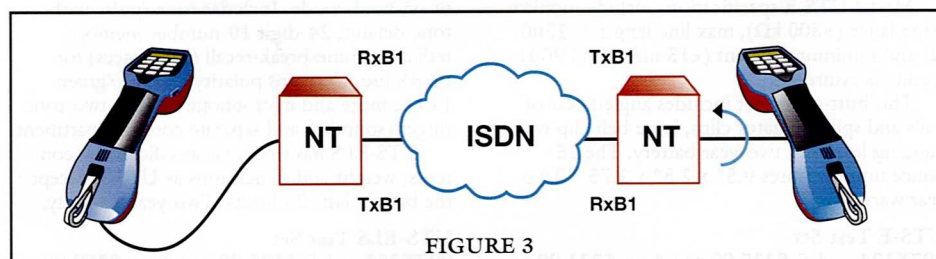
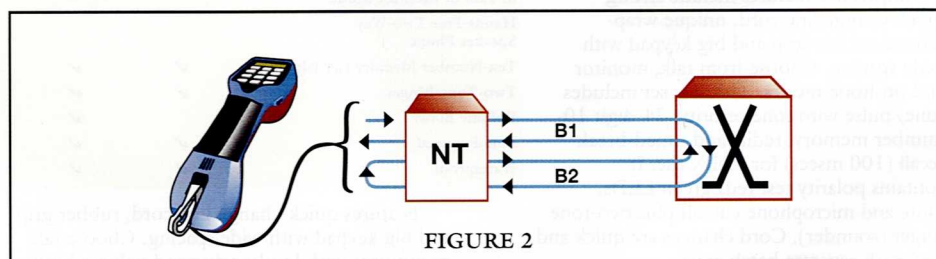
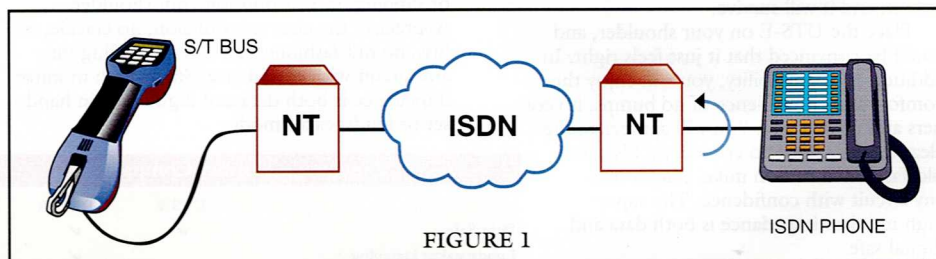
007X300 UTS-ISDN Tester1-5, \$1469.00 ea.; 6-up, \$1380.00 ea.

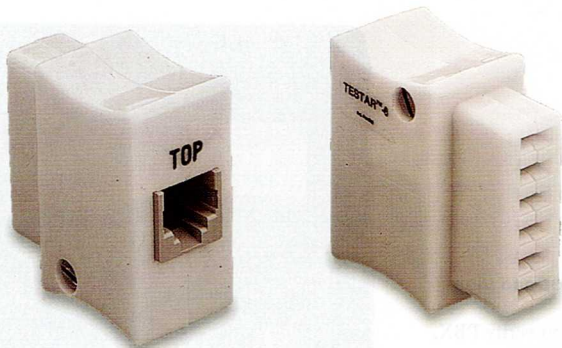
Test Modes of Operation

Voice Call (Figure 1): To make a voice call, scroll to the bearer you need and press the SELECT key. When the prompt "Dial Now:" is displayed, simply dial the number. The UTS-ISDN dials using overlap signalling, so the call is connected when the last digit has been dialed.

Self Call BERT Transmission Test (Figure 2): Dial your own number with the UTS-ISDN in this data call mode. Scroll to the option ">64kb BERT B1" and press SELECT to choose the test length. At the "Dial Now:" prompt, dial the number of your own B2 channel and press the SELECT key. UTS-ISDN dials out using en bloc signalling and then receives the incoming B2 data call, looping back the received data in the B2 transmit direction. It is received on the B1 channel, and a bit error rate test is carried out. Hence the UTS-ISDN tests transmission quality in both directions on both B channels simultaneously. The tester displays the time remaining for the test during the data call and the test result at the end. Also use Self Call mode for supplementary service operation checks and Group 4 FAX teleservice testing without incurring call charges.

End to End BERT Transmission Test (Figure 3): This mode operates with a remote UTS-ISDN which auto answers the data call. It loops back the received data to the originating UTS-ISDN which carries out the BERT test.





TESTAR™

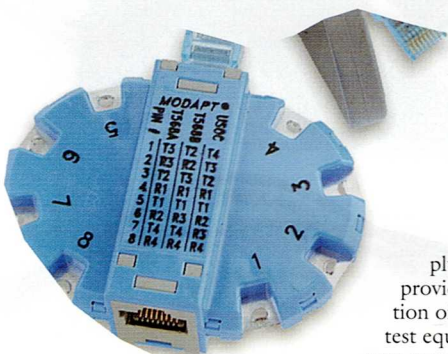
Telephone Set Test Adapters

The Siemon TESTAR Adapters are newly developed test probes for easily and rapidly testing connections directly on the quick connect block. TESTAR inserts directly onto the 66 terminals of the block in a simple straightforward one-handed action. This eliminates the possible problems associated with handling alligator clips or test probes such as accidental shorting across terminals or intermittent test connection.

Available for use on "M" and "E" blocks only, the TESTAR consists of either a two-, four-, six- or eight-wire modular jack on one side and a comparable mating block on the other. Further, each TESTAR has a matted surface on either side of the probe tip for writing designations. The two-, four- and six-wire versions measure 1.5" x 1.5" x .75", and the eight-wire version measures 1.94" x 1.5" x .75".

620X500	TESTAR-2 (Two-Wire).....	1-11,	\$10.00 ea.;	12-up,	\$9.00 ea.
620X505	TESTAR-4 (Four-Wire).....	1-11,	10.25 ea.;	12-up,	9.25 ea.
620X510	TESTAR-6 (Six-Wire).....	1-11,	10.50 ea.;	12-up,	9.50 ea.
620X515	TESTAR-8 (Eight-Wire).....	1-11,	10.75 ea.;	12-up,	9.75 ea.

THE
SIEMON COMPANY



MODAPT™

Modular Adapter

To complement the TESTAR Telephone Set Test Adapters above is the handy MODAPT Modular Adapter. Use it in conjunction with

TESTAR-2, -4, -6 or -8 to allow in-line testing for any plug/jack combination. MODAPT provides access to the jack for connection of telephone butt sets and other test equipment and/or to insert a tone or to test up to four pair directly on a 66 quick-connect M block.

Each MODAPT contains eight .25" wide tin-lead plated contacts permanently encased in impact-resistant polycarbonate wired to a 3" lead and specially modified eight-wire modular plug. It includes two four-pair jacks plus a 6" modular cord terminated with a patented four-pair Universal plug for accessing any six- or eight-position jack. Individual conductors are broken out by pin number and correspond to eight separate test pads. Test equipment can be securely attached to the test pads using alligator clips. The modular plug is specially modified to fit any six- or eight-wire modular jack.

Pair numbers of contacts are clearly molded into the housing. For quick reference in the field, USOC, T568A and T568B wiring charts are printed right on the MODAPT body. A handy belt clip provides easy carrying.

620X450	MODAPT Adapter.....	1-11,	\$17.75 ea.;	12-up,	\$16.50 ea.
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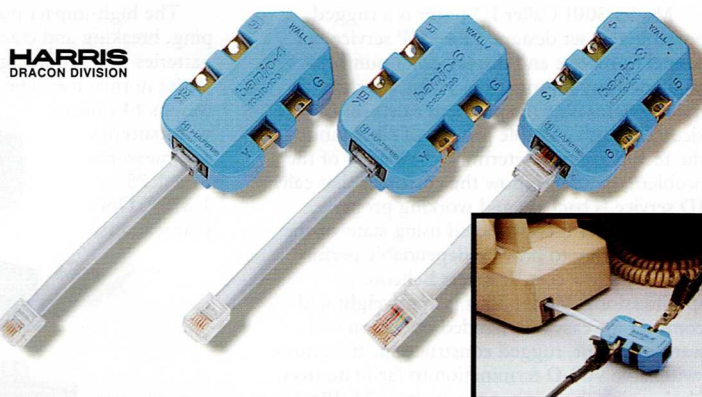
TAP

66-Block Connector System

Designed for one-, two-, three- and four-pair applications, TAP connectors let the user field connectorize 66M and 66E connecting blocks. For example, a TAP can be used to convert a 66M block into a network demarcation block for RJ11C, RJ14C, RJ25C, RJ31X through RJ38X applications. Field connectorizing with TAP also permits re-use of existing cabling in the conversion of 1A2 type installations to electronic key or PBX systems. As an additional benefit, TAP provides modular test access directly on the 66-block. TAP-2 through -8 can be end stacked or mounted side by side on 66M connecting blocks. A total of 24 four-wire, 16 six-wire or 12 eight-wire TAP units can be plugged on the outside rows of a 66M1-50 block.*

*Due to the position of the modular jack on the TAP-2, it cannot be end stacked with other TAP-2 units.

620X600	TAP-2 (Two-Wire)	1-11,	\$9.75 ea.;	12-up,	\$9.00 ea.
620X605	TAP-4 (Four-Wire).....	1-11,	10.00 ea.;	12-up,	9.00 ea.
620X610	TAP-6 (Six-Wire).....	1-11,	10.50 ea.;	12-up,	9.50 ea.
620X615	TAP-8 (Eight-Wire).....	1-11,	10.75 ea.;	12-up,	9.75 ea.



Banjo Modular Adapters

Harris Dracon's Banjo Modular Adapters permit testing on working lines. They allow circuit access without disconnecting equipment and feature replaceable test leads. If the modular jack clip breaks, just replace the test cord. Sturdy copper contacts are angled to prevent alligator clips from disconnecting during testing. Small holes in each contact allow for the use of test probes. Each circuit is clearly identified on the sides and bottom. Choose from four-, six- and eight-wire configurations for voice and data applications. Heavy-duty, molded-in clip included for attaching to shirt pocket or tool pouch. Banjo Modular Adapters are indispensable tools for telephone system technicians. Replacement cords may be purchased separately (five/pkg.).

350X156	10210-100 4-Wire Adapter..	1-11,	\$19.00 ea.;	12-up,	\$18.00 ea.
350X161	10220-100 6-Wire Adapter..	1-11,	20.00 ea.;	12-up,	19.00 ea.
350X191	10230-100 8-Wire Adapter..	1-11,	24.00 ea.;	12-up,	23.00 ea.
350X130	10200-000 4-, 6-Wire Repl. Cord.....				10.00 pkg.
350X210	10300-000 8-Wire Repl. Cord.....				11.00 pkg.

Dracon Modular Adapter

Quickly Connects Any Butt-in Test Set to a Phone Line

This modular adapter lets you easily connect your butt-in test set to any phone line. Its 4-inch size and riveted spring clip keep it always at hand when you need it. Durable manufacture, four clearly marked contacts for

error-free termination and standard telephone jack distinguish this adapter.

10113-000 Dracon Modular Adapter

350X090.....	1-11,	\$12.25 ea.;	12-up,	\$10.75 ea.
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LineMaster™

Master Line Analyzer

The LineMaster provides field technicians with a real-time storage meter for quick diagnosis of problems in CPE and C.O. environments. This inexpensive, portable unit will increase productivity by reducing installation, maintenance and repair time. Digit analyzing allows confirmation of on/off hook, zero volt, hookflash/wink and dialed digits (DTMF and pulse) complete with parameters (On/Off timing and dB level).

A digital multimeter facilitates quick measurement of dc volts on/off hook talk battery level, dc milliamps loop current and ac volts ring voltage and power supply. To place, receive and monitor telephone calls in either hands-free or normal mode, use the lineman's test set with 4X4 touch pad and speakerphone. A tone generator

assists in cable pair identification and loop-loss measurement.

With LineMaster, technicians can verify PBX, Voice Mail/Auto Attendant and ACD Programming; confirm proper ANI strings; verify proper signal protocol in DID/TIE line disputes; or determine transmitting and/or receiving equipment faults. A Ziad first is the real-time visual display of "talk-off" featured on the LineMaster.

The instrument's case material is constructed of high-impact ABS. Four-foot test leads include mini-alligator clips. The 1.5-volt dc AA battery now has an increased life of 60-90 hours. A sturdy carrying case is constructed of double wall, foam lined polyethylene. The 16-ounce unit is 7.0" x 3.9" x 1.4". Ninety-day warranty.

385X300 LineMaster 1-5, \$399.00 ea.; 6-up, \$369.00 ea.

PROGRESSIVE ELECTRONICS INC.

Model 300I

Basic Caller ID Tester

Model 300I Caller ID tester is a rugged portable test set designed for OSP service personnel to receive and display caller number/name delivery information. It lets a technician quickly determine if a problem exists on the service. Through a simple process of elimination, the technician can determine the source of the problem, fix it and show the customer that caller ID service is back on and working properly.

This tester is constructed using state-of-the-art technology to provide dependable performance at a low cost. It meets Bellcore specifications. Model 300I is lightweight and compact for easy one-handed operation with water-resistant, rugged construction. It features switchable 900-Ω termination to facilitate troubleshooting, high input sensitivity (-34 dBm) and wide angle display for easy viewing.

The high-impact plastic housing resists chipping, breaking and cracking. Includes four AA batteries with a life of greater than one year under normal use. The unit weighs 14 ounces with batteries and measures 8" x 1.75" x 1.375". One-year warranty.

367X350 300I Caller ID Test Set 1-5, \$158.00 ea.; 6-up, \$150.00 ea.



CID-150

Deluxe Caller Identification Test Set

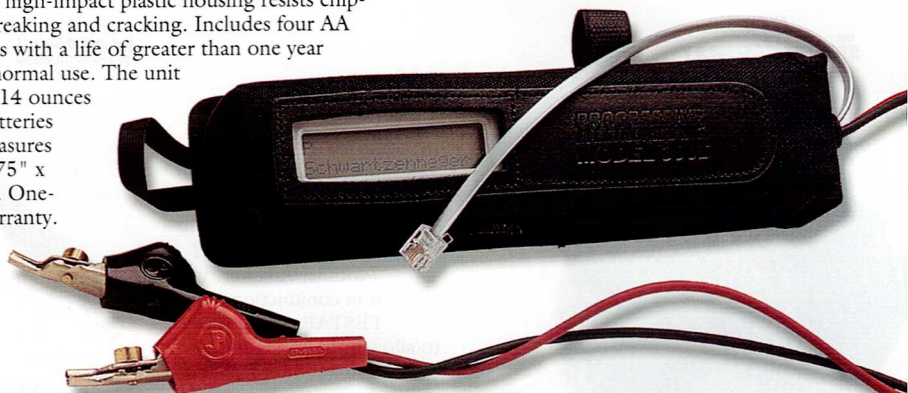
With the compact, easy-to-operate CID-150 Caller Identification Test Set, technicians can easily measure line and signal parameters associated with on-hook and off-hook caller ID service. In the manual mode, the CID-150 simultaneously indicates line and ring voltages, loop current and C-Message noise. Select the automatic Test Mode to capture caller ID messages up to 150 characters in length and display them along with signal and timing measurements. CID Test parameters include mark/space levels, noise between rings, ring voltage level, ring/OSI and silent

period, transmit/receive checksums and caller ID, both Alpha and Numeric. CPE responses are measured for off-hook signaling. CID during call waiting is also indicated where those services are offered.

A simple front panel layout and large dot matrix LCD display make the CID-150 easy to use and learn. With only three switches required to access all of its capabilities, test set operation is virtually automatic. When all tests have been performed, the CID test results are presented in a series of data screens on the LCD display.

The CID-150 operates up to 15 hours on an internal rechargeable battery. An on-screen indicator is provided to show internal battery charge. The unit comes complete with battery, ac charger, padded carrying case and instruction manual. This 1.5 pound unit is 4" x 7.5" x 1.75". Ninety day warranty.

610X005 CID-150 Caller Test Set 1-5, \$695.00 ea.; 6-up, \$660.00 ea.



701K Tone/Probe Kit

High-Power Telecom Test Set with Inductive Amplifier

PEI's 701K Kit includes a 77HP High-Powered Tone Generator and a 200EP Inductive Probe in a 700C Combo Case. Use the Tone Tracer to send tone, test continuity plus identify tip and ring. The battery-powered Line Aid eliminates the need for a handset. Both items are protected in a sturdy case. Order this three-piece kit to save over buying them individually.

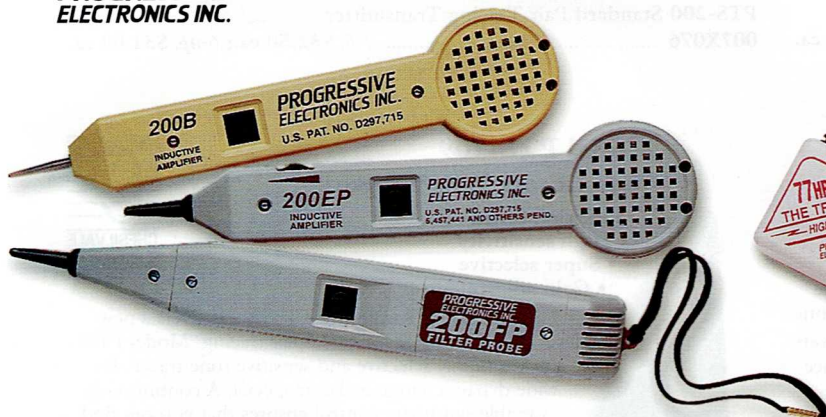
The Tone Tracer offers +7 dBm output for reception up to 50,000 feet and through low-resistance circuits. It comes with a modular connector plus two leads and clips. The 200EP Inductive Amplifier with built-in speakers identifies and traces wires within a group without damaging insulation. Connect Tone Tracer lead to subject wire and other lead to earth or equipment ground (for improved transmission of tone). Turn on Line Aid, and touch tip to insulation of each suspect conductor. Tone will be loudest on subject wire.

These two items are organized and protected in the 700 C Combo Case's individual compartments. The universal tone pouch fits all PEI tone generators. A reinforced leather tip in the probe compartment keeps the tip from protruding through material. A protective flap shields contents from moisture and breakage. The velcro belt loop attaches the case to any belt without unbuckling. This black Cordura case is 10" x 5" x 2" and weighs 3 pounds with contents. One-year warranty. The case is also available separately.

367X701 701K Tone/Probe Kit1-9, \$92.00 ea.; 10-up, \$87.50 ea.
367X700 700 C Combo Case Only.....15.00 ea.



**PROGRESSIVE
ELECTRONICS INC.**



Inductive Amplifiers

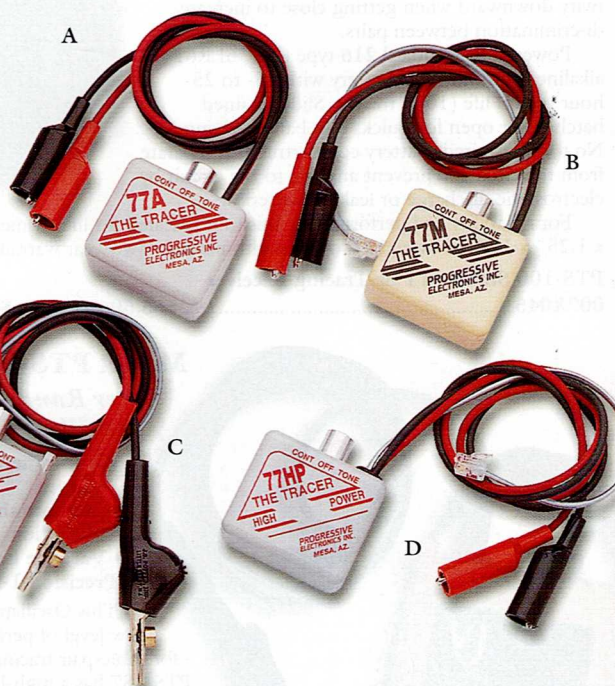
Line Aids Eliminate Need for Handsets

Inductive amplifiers are designed specifically to work with PEI's Tone Tracers. They provide easy one-handed, battery-powered operation. Their unique design identifies and traces wires within a group without damaging insulation. Connect Tone Tracer lead to subject wire and other test lead to earth or equipment ground. Turn on Line Aid and touch tip to insulation of each suspect conductor. Tone will be distinctly loudest on subject wire.

High-impact ABS plastic Line Aids have built-in speakers. The 200B features a water-resistant Mylar speaker for reliable outdoor use. Model 200EP has recessed volume control to prevent accidental turn on. Standard 9-V battery (not supplied) is required. Leather Holster is optional. Each high-quality tool is 8" x 2.1" x 1.1" and weighs just 5 ounces. One-year warranty.

The 200FP is the only probe that stops power line hum. It blocks ac interference by filtering out power-related noise. Switch selects filter or standard operation. Probe is audible within 15" of a conductor carrying a 5-V peak-to-peak signal. Includes wrist lanyard. This 4.7-ounce probe is 9.75" x 1.25" x 1.375" with 9-V type 1604 battery (not included). One-year warranty.

367X202 200 B Line Aid1-9, \$54.00 ea.; 10-up, \$51.50 ea.
367X210 200 EP Line Aid1-9, 57.00 ea.; 10-up, 54.50 ea.
367X220 200 FP Line Filter Probe.....1-9, 105.00 ea.; 10-up, 99.50 ea.
645X025 K-9V-1 9-Volt Alkaline Battery.....3.90 ea.
367X205 200 C Leather Holster (Fits 200 B and 200 EP).....8.00 ea.



77-Series Tone Tracers

Send Tone, Test Continuity Plus Identify Tip and Ring

The 77-Series Tone Tracers are continuous or alternating tone generators that test for continuity, polarity, voltage and resistance. They generate a distinctive audible tone detectable with headset or inductive amplifier. Tracers are compatible with ESS, Step and Crossbar. Output tone is isolated from all dc voltages. Operation couldn't be easier. All tests may be detected, traced or located either by audio or LED indicator. Simply attach the leads to wire or cable via alligator clips or modular plug.

Choose from four models. The original 77A (A) tracer features two standard alligator clip leads. Model 77M (B) includes modular connector lead plus two alligator clip leads. High-powered 77HP/6A (C) and 77HP (D) feature +7 dBm output for reception up to 50,000 feet and through low-resistance circuits. The 77HP/6A includes modular connector and two J.S. Popper 6A type (piercing) clip leads. Model 77HP has modular connector plus two leads and clips. Optional 77 C Case fits all four. One-year warranty.

367X077 77 A Tracer.....1-9, \$25.00 ea.; 10-up, \$23.75 ea.
367X082 77 M Tracer (Modular).....1-9, 28.00 ea.; 10-up, 26.75 ea.
367X084 77HP/6A Tracer w/ 6A Clip.....1-9, 33.00 ea.; 10-up, 31.50 ea.
367X080 77 HP High-Powered Set.....1-9, 30.00 ea.; 10-up, 28.50 ea.
367X079 77 C Case Only (fits all four models).....7.00 ea.



Model PTS-100 Tone Tracker Probe

Pair Tracing Receiver

- Works with any 500-Hz to 1.2-kHz oscillator
- Water and dust resistant
- Sensitivity control, 30-dB adjustment
- Built-in loudspeaker

Use the easy-to-operate, pocket-sized PTS-100 Tone Tracker Probe with adjustable gain for pair tracing. This high-quality, durable, ergonomically designed receiver is built to withstand arduous use. Use it on protected and unprotected, outside plant and in-building cable facilities.

A waterproof sensitivity control gives long-range pick-up and close-in discrimination ability. Operation is always single handed. Just press the button and seek the strongest signal. Locate the cable pair by listening to the audio output from the built-in loudspeaker which produces a sound level proportional to signal strength. Adjust sensitivity downward when getting close to increase discrimination between pairs.

Powered by standard 216 type (IEC 6LR61) alkaline or lithium 9-V battery with 15- to 25-hour typical life (1000 traces). Slide retained hatch cover open for quick, easy battery changes. No tools required. Battery compartment is separate from the circuit to prevent any risk to the circuit by electrostatic discharge or leaking batteries.

For reliability and performance, this unit is sealed for life. It measures 8" x 1.25" x 1.6" and weighs 6 ounces with battery. Two-year warranty.

PTS-100 Standard Pair Tracing Receiver

007X045 1-5, \$65.50 ea.; 6-up, \$62.50 ea.



Model PTS-200 Mini Oscillator

Pair Tracing Transmitter

- -3 dBm \pm 3 dBm output level
- 1004-Hz frequency \pm 100-Hz sweep tone
- 6-Hz nominal sweep rate
- Resistance test to $>1000 \Omega$
- Polarity/voltage test to $>1500 \Omega$ at 50 V

Model PTS-200 is a miniature but versatile oscillator for pocket-sized pair tracing. It is easy to operate with a high degree of water and dust resistance. The three-position switch includes continuity, polarity/off and oscillator.

In continuity position, PTS-200 will test the resistance of the line, indicating a short circuit if present. If switched to polarity, the line voltage and its polarity may be determined. LED brightness approximately determines voltage and resistance. A short-circuited pair cannot be traced, so any short detected will have to be cleared. PTS-200 emits a distinct continuous swept frequency tone.

Powered by 216 type (IEC 6LR61) alkaline or lithium battery for 290-hour typical life. Connect to line using alligator clip leads or RJ11 modular jack plug. Unit is sealed for life for reliability and performance. It measures 4.8" x 1.3" x .8" and weighs 3.5 ounces including battery. Two-year warranty.

PTS-200 Standard Pair Tracing Transmitter

007X076 1-5, \$32.50 ea.; 6-up, \$31.00 ea.



Model PTS-287

Super Range Oscillator

- Pure sine wave output
- Remote short detection
- Variable beep rate
- Precision 1-kHz tone

This Oscillator delivers a new level of performance for cable-pair tracing. The PTS-287 has a high-level precise 1-kHz pure sine wave output for low crosstalk and minimal interference. The tone may be varied between a slow beep and continuous output. It is ideal for two-person cable jointing. When the pair is identified, the jointer shorts it to kill the tone. The short is indicated by an increase in headset tone level.

Specifications include: output (1 kHz \pm 10 Hz, pure sine wave); variable cadence (3-14 Hz, 50/50 duty cycle and continuous); line connected audio indication (>100 m, 350 feet); line shorted detector — LED and audio level change range (0-2 km, 8 k feet).

The impact- and water-resistant oscillator features welded construction to ensure the longest life in arduous conditions. It operates on six 90-hour AA alkaline cells. Includes LEDs for on (slow flash) and low-battery (rapid flash of two seconds on, one off). PTS-287 even transmits the signal by changing to a distinctive cadence. No tools are required for quick, easy battery changes with pop-off lid. Includes RX17 headset socket and hanging strap. The .35-pound unit is 5.5" x 2.25" x 1.5". One-year warranty.

007X119 PTS-287 Oscillator 1-5, \$172.00 ea.; 6-up, \$163.50 ea.



Model PTS-109

Super Range Tone Tracker

- Precision tuned
- High sensitivity
- Super selective
- Gain adjustment

The PTS Super Range Tone Tracker delivers a new level of performance for cable-pair tracing. Model PTS-109 is a highly selective and sensitive tone tracer. Its wide dynamic range makes it special. A continuously variable sensitivity control ensures that you can find the weakest signal or discriminate with the strongest. The PTS-109 features a direct contact metal probe tip, audio output and variable click rate. It is audible in 96-dB traffic noise. Super filtering ensures that mains hum is rejected. Signals are always audible even in the noisiest environment due to unique click-generator output.

Specifications include: pick-up range (0-2 m, 6 feet); minimum signal detection level (≈ 100 mV p-p); continuous gain adjustment (> 30 dB).

This impact- and water-resistant tone tracker features welded construction to ensure the longest life in arduous conditions. It operates on 40-hour alkaline IEC 6LR-61 (1604) batteries. No tools are required for quick, easy battery changes with the sliding battery compartment lid. Includes low-battery indicator, RX17 headset socket and wrist/hanging strap. The .2-pound unit measures 8.5" x 1.75" x 1.5". One-year warranty.

007X050 PTS-109 Tone Tracker 1-9, \$93.00 ea.; 10-up, \$88.50 ea.





Tone Generator and Probe Kit

This Ideal cable locator kit (pictured above) contains 62-100 Tone Generator which offers a convenient choice between continuous and alternating tones. A three-color LED display indicates correct polarity, reverse polarity, the presence of ac as well as continuity. The included 62-104 Amplifier Probe with adjustable sensitivity level lets you zero in on cable groups, pairs and individual wires. Kit contents come in a sturdy plastic case for convenient protection and storage. One year warranty.

Optional 33-804 Tone Kit includes 62-100 Tone Generator and 62-104 Amplifier Probe. Contents come in a sturdy nylon pouch with belt loop and velcro closure for easy storage and convenience. One-year warranty.

33-802 Tone Generator and Probe Kit
370X1051-5, \$99.00 ea.; 6-up, \$93.50 ea.

33-804 Tone Kit
370X1071-5, \$99.00 ea.; 6-up, \$93.50 ea.

Triplett Fox and Hound

Fox Tone Generator and Hound Inductive Tracer easily locate hidden, hard-to-find and complex wiring. They offer more features and greater cost efficiency than would-be competitors.

The Fox generates three distinctive tones for wire tracing. LEDs ensure continuity. Automatically line powered in tone modes with the strength to communicate on handsets or power a phone. The Hound's small profile tracks tones generated by the Fox. High-gain, high-impedance amplifier and mylar cone speaker sound off loud and clear. Instructions printed on unit.

Order separately or as a pair. Each 7-ounce unit is 1" x 2" x 3.5". One-year warranty.

090X800 Model 3380 Fox1-5, \$27.00 ea.; 6-up, \$25.50 ea.

090X810 Model 3390 Hound1-5, 47.00 ea.; 6-up, 44.25 ea.

090X805 Model 3385 Fox/Hound Pkg. ...1-5, 69.00 ea.; 6-up, 65.00 ea.

PROGRESSIVE ELECTRONICS INC.

Model 88 Load Coil Detector

Designed for telephone cable use by outside plant or C.O. technicians, even inexperienced personnel can indicate the presence and number of load coils on active or dead cable pair quickly and easily. Eliminate waiting time in an unmanned central office by conducting the test yourself. Ease of use, compact size, rugged construction, reliability and economical price make Model 88 an industry favorite. It reads 44, 66 and 88 mH plus counts up to four loads.

Model 88 is powered by a 9-volt battery (not included). It is only 4" x 2.25" x 1.5" and weighs just 4 ounces. One-year warranty.

367X088 Model 88 Load Coil Detector ...1-9, \$72.00 ea.; 10-up, \$66.00 ea.



Twisted-Pair Installer Kit

Cable ID kit includes everything installers need for identifying, cutting, stripping and terminating twisted-pair cable. You get 62-100 Tone Generator and 62-104 Amplifier Probe for identifying cable pairs, 35-051 Cable Cutter, 45-165 Cable Stripper for removing twisted-pair outer jackets, 30-522 RJ-45 eight-position modular plug crimp tool and 30-556 RJ-11 modular plug die set. A heavy-duty plastic case with foam inserts stores and protects tools from job site conditions. One-year warranty.

33-803 Cable ID Kit
370X1191-5, \$239.00 ea.; 6-up, \$225.00 ea.

Wire Hunter Kit

The Wire Hunter locates hidden wires behind walls, ceilings or up to 3 feet underground including wire termination point location. This versatile tool can be used on both de-energized and energized circuits up to 120 V ac. Operating range extends to 1000 feet. Lightweight, durable and compact, the 62-104 Amplifier Probe is powered by a 9-V battery and features solid-state circuitry for job site dependability and low power consumption. The unit generates a silent RF tone for minimal interference with other circuits. A durable carrying case provides convenient storage and protection. One-year warranty.

62-120 Wire Hunter Kit
370X4491-5, \$215.00 ea.; 6-up, \$203.00 ea.



TRIPLETT

Triplett Hound 2 Probe-Type Inductive Tracer

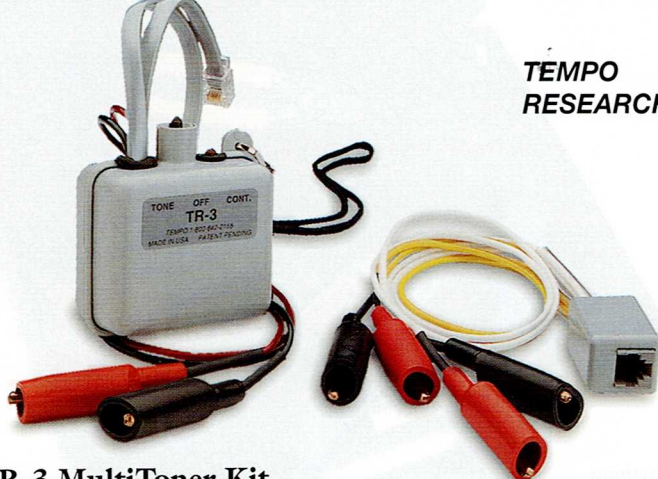
The Hound 2 is a portable, hand-held inductive tracer that aids in identification of wires without piercing their insulation. A streamlined probe-type case design allows for better access in tight, hard-to-reach areas. It features a self-contained high-gain, high-impedance amplifier and a rugged, moisture-resistant, mylar cone speaker. Use the Hound 2 in conjunction with the Triplett Fox for quick and efficient wire tracing.

A 9-volt alkaline NEDA 1604A battery (not included) is required. At 5 ounces with battery, it is 1.9" x 1.4" x 7.2". One-year warranty.

090X778 Model 3236 Hound 21-5, \$47.00 ea.; 6-up, \$44.25 ea.



TEMPO RESEARCH



TR-3 MultiToner Kit

Generates Three Tones at Once

- Three simultaneous tone frequencies: 800 Hz, 1 kHz and 1.2 kHz
- Output level: 12 V peak-to-peak square wave through .1-μ capacitor

Tempo Research's TR-3 MultiToner is three tone generators in one. It is the only model to provide three distinct tones (800 Hz, 1 kHz and 1.2 kHz) all at the same time from just one unit. Positively identify three separate cable pairs or wires simultaneously, using any inductive tracer/probe with one initial set-up. TR-3 reduces the amount of time and the number of tone generators required at the job site. This cost-efficient kit is just half the price of three single-tone generators. It is designed for such applications as telephone, data, security/alarm, audio/visual, HVAC and electrical systems.

Tone number one is transmitted through alligator clips; all three tones are transmitted on RJ11 modular plug. For tracing in either direction or regardless of facility, use optional two-pair adapter to direct tones two and three to alligator clips. TR-3 provides all the other functions of an average, single-tone generator including continuity (one pair), polarity, talk battery, line status testing and toning up to 50,000 feet. Uses one 9-V NEDA 1604 or equivalent battery (not included). This 2.5" x 2.5" x 1.4" unit weighs 4.4 ounces with battery. Includes adapter and case. One-year warranty.

470X180	1190-5002 TR-3 Kit.....	1-9, \$68.50 ea.; 10-up, \$65.50 ea.
470X170	1190-5000 TR-3 Only.....	1-9, 44.50 ea.; 10-up, 43.00 ea.
470X140	1190-0208 Two-Pair Adapter Only.....	14.95 ea.
470X150	1190-0250 Carrying Case Only.....	11.95 ea.

Model 600 LS

Deluxe Tone Test Set

- Full-featured tone generator
- Tests for polarity, voltage level and resistance
- Tests for capacitance (number of ringers attached to line)

The 600 LS is the state-of-the-art installation and repair test set for the telecommunications industry. It combines all of the features found on the 100 B as described at the right plus much more. In fact, this unit actually combines a tone generator with a voltage level, polarity, resistance and capacitance tester! Additional features include the ability to analyze modular phone connections visually via four LEDs on the back of the unit (verifies Tip and Ring) and estimate the number of ringers connected to a line. Tests for station ground, detects high-resistance leakage (also shorts, grounds and crosses), tests for isolation faults and provides a talk battery.

Model 600 LS is made of high-impact ABS plastic and powered by 9-V batteries (available separately). At 8 ounces, it is a compact 2.4" x 5.9" x 1". One-year warranty.

367X600	600 LS Deluxe Tone Test Set.....	1-9, \$72.00 ea.; 10-up, \$66.00 ea.
367X605	600 C Leather Holster.....	8.00 ea.
645X025	K-9V-1 Alkaline Battery.....	3.90 ea.



TR-4 MultiToner

Generates Four Tones at Once

- Four simultaneous distinct tone signals: 800 Hz; 800 Hz and 1 kHz; 800 Hz, 1 kHz and 1.2 kHz; plus 800 Hz, 1 kHz, 1.2 kHz and 1.6 kHz
- Output level: 12 V peak-to-peak square wave through .1-μ capacitor

Designed for RJ45 and data applications, Model TR-4 MultiToner is four tone generators built into one. It delivers four distinct tone signals all at the same time through its RJ45 plug. The TR-4 sends all four distinct tone signals simultaneously from the RJ45 location with one set-up, thus reducing time spent going back and forth from the tone origination location. Four separate cable pairs or wires are identified all at the same time.

The four tone frequencies are 800 Hz, 1 kHz, 1.2 kHz and 1.6 kHz. Tone signal number #1 sends a pulsing 800-Hz tone (pin #4, 5 blue/white-blue). Tone signal #2 sends a pulsing 800-Hz and 1-kHz tone (pin #3, 6 green/white-green). Tone signal #3 sends a pulsing 800-Hz, 1-kHz and 1.2-kHz tone (pin #1, 2 orange/white-orange). Tone signal #4 sends a pulsing 800-Hz, 1-kHz, 1.2-kHz and 1.6-kHz tone (RJ45 and data applications; pin #7, 8 brown/white-brown). These four tone signals are very distinct from each other and easily identified with a probe or butt-in test set.

When tracing an ac power line, make sure the line is not energized before connecting to it. Simply plug the easy-to-use TR-4's RJ45 plug into the RJ45 wall jack and turn the switch to "Tone." All four distinct tone signals are delivered simultaneously to trace and identify four separate wires.

The TR-4 comes complete with a lanyard, strain-relief cord. This Multi-Toner is powered by one 9-volt NEDA 1604 or equivalent battery (not included). The unit measures 2.5" x 2.5" x 1.4" and weighs 4.4 ounces with battery. One-year warranty.

470X195	1191-5000 TR-4.....	1-9, \$59.50 ea.; 10-up, \$57.00 ea.
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PROGRESSIVE ELECTRONICS INC.

Model 100 B

Standard Tone Test Set

- Performs both ac and dc voltage testing
- Provides talk power
- Resistance testing to 10 MΩ
- Audio trace tone

Model 100 B is a multi-purpose test set for use by anyone working with wires or cables. It performs four functions. **Tone** sends a measured dual-tone audio trace signal to identify drop wires, i/o pairs and prove continuity. **Resistance** determines shorts between conductors or shorts to ground. **Polarity** provides visible indication of polarity of the central office battery present at the protector or modular outlet. **Calibration** checks for insulation faults by a series of comparison checks of internal MΩ resistor.

The 100 B utilizes a four-position slide switch plus modular cord and alligator test clips for operation. Includes LED for polarity testing and miniature internal speaker for audible detection of insulation faults and resistance level testing. This 5-ounce unit is 2.25" x 4" x 9". One-year warranty.

367X103	100 B Tone Test Set.....	1-9, \$55.00 ea.; 10-up, \$50.00 ea.
367X105	100 C Leather Holster.....	8.00 ea.
645X025	K-9V-1 Alkaline Battery.....	3.90 ea.





Coax Tracer System Kit

Transmitter with Two-in-One Probe

- Identifies cables through the sheath and at the cable end
- Reduces trouble-shooting time, saving money on every dispatch
- The more you use it, the more you save

Take the guesswork out of coax identification and location with the Coax Tracer System (CTS). This easy-to-use, two-unit system outperforms the current cable location method. A transmitter outputs two tones simultaneously through the push-on F connector. The dual-purpose probe detects and receives the 84-kHz tone inductively (through the sheath anywhere along the cable path) or the 1-kHz tone capacitively (at the end of the cable).

By tracing the tone inductively, you can identify the targeted coax cable out of a bundle or at the junction box without disconnecting and probing each cable end. This saves time, unnecessary service interruption and potential RF leakage caused by capacitive toning methods of standard tone generator/probe tracing devices. Prevent interruption of other customer services while you minimize customer complaints and repeat visits. Reduce the potential for RF leakage due to less drops being disconnected for ID purposes.

The CTS Kit includes transmitter, probe and softcase. Two-in-one probe works with standard tone generators. The 9.8-ounce transmitter is 5.125" x 2.625" x 1.625". It is powered by six AA batteries for 60 hours of continuous use. The 6.7-ounce probe is 7.5" x 2" x 1.5". It is powered by a 9-volt dc battery for 24 hours of continuous use. One-year warranty.

470X320 3110-5001 CTS Kit.....1-5, \$229.50 ea.; 6-up, \$219.00 ea.
470X300 3110-5000 Transmitter/Probe 1-5, 221.50 ea.; 6-up, 211.00 ea.
470X340 3110-5002 CTS Probe Only.....1-5, 79.50 ea.; 6-up, 76.00 ea.

Tempo Hunter Probe

Tone Probe

- Insulated probe tip detects line signal
- Speaker provides audio tone signals or trace tone detection
- Hand set terminals allow for butt-set connection

The Tempo Hunter Probe detects three-tone signals from the TR-3 MultiToner Tone Generator, four-tone signals from the TR-4 MultiToner Tone Generator or tracer tone from a standard, single-tone tone generator or similar device. Use it to detect tracer tone up to 12 inches away from wire carrying 10-volt peak-to-peak signal. Probe tip is insulated to 300 volts.

Just press and hold the on/off button for easy operation. The unit automatically detects tracer tone signals and warble tracer tone and then emits an audible tone from the speaker. To identify a wire pair that has trace tone, scan an area. As you get closer to or touch the correct pair, you will receive a clear, distinct tone.

Terminals located at the base of the unit let you connect a butt-in test set or other handset device. This automatically turns on the Tempo Hunter



and disables the speaker, but you will hear the tones through your handset in monitor mode.

This tone probe is powered by a 9-volt battery (not included) for three months of average daily use. The 6-ounce Hunter measures 7.5" x 2" x 1.5". One-year warranty.

470X120 1114-5010 Hunter Probe.....1-5, \$45.50 ea.; 6-up, \$43.50 ea.
470X100 1114-0260 Carrying Case10.00 ea.

**TEMPO
RESEARCH**



MultiToner/Probe Kit

Maximizes Efficiency and Savings

- Cost-efficient three-piece combination kit
- Includes TR-3 MultiToner and Tempo Hunter Probe

This unique kit contains a TR-3 MultiToner Tone Generator (described on the facing page), a Tempo Hunter Probe (featured above) and a Two-Pair Adapter. Tempo Research's bargain-priced combination maximizes the efficiency of each device. Save more by purchasing these three products conveniently packaged in a cost-efficient kit rather than as separately ordered items.

Model TR-3 offers all single-tone generator functions with the addition of providing three distinct tones simultaneously from a single unit. Use the probe to detect the TR-3's three-tone signals. These two color-coordinated units make a handsome set. For tracing in either direction regardless of facility, use the two-pair adapter to direct tones two and three to alligator clips.

The TR-3 MultiToner requires one 9-V NEDA 1604 or equivalent battery (not included). It is 2.5" x 2.5" x 1.4" and weighs 4.4 ounces with battery. The Tempo Hunter Probe is powered by a 9-volt battery (not included) for three months of average daily use. This 6-ounce probe is 7.5" x 2" x 1.5". Optional case provides convenient kit storage. One-year warranty.

470X190 1190-5500 Toner/Probe Kit...1-5, \$115.50 ea.; 6-up, \$110.00 ea.
470X160 1190-0260 Carrying Case17.00 ea.



Sidekick™ 7B**Easy-to-Use Handheld Multi-Function Tester**

- Reduces customer repeats
- Analog meter gives instant readout
- Indicates any imbalance which can produce noise
- Determines the noise susceptibility of a dry pair
- Determines stressed balance of a working pair

Since Tempo Research introduced the Sidekick™ in 1991, this patented technology has proven to reduce repeat reports in field evaluations and everyday use. Thousands of times everyday across the nation, technicians use this meter, supervisors see the results, and customer service goals become attainable. This analog meter provides instant readout. Features include rapid testing of ohms, volts and capacitive kick plus single hookup testing of tip-ring, tip-ground and ring-ground. The Sidekick provides tone for identifying pairs or crossed conductors. Drying effect is minimal on all ranges.

The line test provides the ability to determine capacitive and series resistance balance characteristics of a telephone pair. This is accomplished by exciting the pair in a longitudinal or simplex fashion through a network that is perfectly balanced between tip and ring while measuring the metallic signal caused by any unbalance on the pair. The meter reads the audible noise produced on a pair stressed by a 90-dBrn power influence excitation. This line test is very effective in identifying series imbalances like those produced by series resistance opens (high joints) and dc resistive or capacitive imbalances that will not be detected by a standard noise metallic or balance measurement with a subscriber loop test set.

This instrument also provides a dc voltmeter, an ohmmeter with a kickmeter function and a "points" scale. Pair condition is simple to determine, and approximate meter readings tell you what to do. Below 20 is acceptable service. A reading of 20-30 is questionable, so isolate the pair and test in both directions. Above 30 is unacceptable.

Stressed noise and stressed balance measurements are more sensitive to pair imbalance problems than noise metallic and longitudinal balance measurements are. Read stressed noise across a pair stressed by a 90-dBrn longitudinal excitation. To obtain a stressed balance reading, subtract the stress noise reading from the longitudinal stress of 90. Use the leakage test to detect intermittent resistance faults that do not show up under normal VOM tests. An RX 10,000 ohmmeter uses 150 volts dc to punch through the oxide layer and reveal the fault.

Includes test leads, battery and manual. The 16.2-ounce Sidekick measures 8.7" x 3.4" x 2". One-year warranty.

470X130 1131-5001 Sidekick 7B.....1-2, \$729.50 ea.; 3-up, \$694.00 ea.

Sidekick 7B Specifications

Resistance:	RX1: Reads 0-2000 Ω RX1000: Reads 0-2 M Ω
Voltage:	100 volts dc Accuracy $\pm 3\%$ of full scale Input impedance 1 M Ω
Line Test:	0-100 dBrn Accuracy ± 5 dB overall ± 2 dB from 10 to 50 dBrn Longitudinal excitation +90 dBrn
Battery:	9-V alkaline transistor battery NEDA 1604, IEC 6LR61 Approximately 35-hour life

**TEMPO
RESEARCH****Tempo Talk****Quickly Establish Talk-Pairs**

- Lightweight sets are self-contained
- Battery powered with hands-free operation
- Each set has a flexible microphone and a padded earpiece
- No central office battery needed

Tempo Talk sets establish talk pairs without using cumbersome handsets, tone sources and batteries. You get a pair of self-contained, battery-powered Talksets that allows technicians to communicate between two locations up to five miles apart without central office battery. Use Tempo Talk sets on telephone cable (twisted pair), coax and electrical wiring (do not hook up to "live" wires). Six units may be placed in parallel without any loss in signal.

Each Talkset features a flexible microphone with a single padded earpiece. A separate housing with a convenient belt clip contains the on/off switch, battery and circuitry. This combination provides the convenience of hand-free operation. You can connect the Tempo Talk set to a wire pair via "Popper Clips" which allow you to connect binding posts, bare wires or insulated wire.

Frequency specification is voice band, passive line (vacant). Each set is powered by a 9-volt dc battery. Pair includes two headsets, two housings, test leads and manual. Headset weight is 2 ounces and dimensions are 6" x 7". Each housing measures 4" x 2.25" x .75" with 10.3-ounce complete Talkset weight. One-year warranty.

470X500 4130-5001 Tempo Talk Pair..1-5, \$359.50 ea.; 6-up, \$342.00 ea.





Model 501 Underground Cable Locator

- For long-range locating
- Locates line splices
- Highly accurate and easy to use

Model 501 Underground Cable Locator is a portable locating system that consists of four basic components. **Transmitter** can be connected directly to one end of the cable, to the Inductive Coupler or to the Inductive Antenna. It generates an RF signal that is modulated with a tone of approximately 1000 Hz, which permits effective performance even at distances greater than 4000 feet and to depths of more than 7 feet. **Inductive Coupler** clamps around the cable, sending a tone which enables the user to locate active or dead cables.

Inductive Antenna is mounted inside the carrying case and can be placed over the cable, wire or metallic pipe to be located. The Inductive Antenna transmits a signal through the ground onto the cable to be located. **Receiver** is a hand-held unit used to trace the path of the cable. Mounted on

a 32" handle, it has an ON/OFF sensitivity control knob, a meter to read the signal strength and a speaker to hear the tone.

Capable of operating on dead or active lines, Model 501 has been designed as a rugged, reliable and easy-to-use tool. It is battery operated (eight AA and one 9 V — not supplied), utilizes solid-state circuitry and features both a speaker for audible tracking and a meter for reading signal strength.

It comes complete with all four components as described above, two 8-foot black leads with clips, a durable ABS carrying case and a guide to operations. The Model HS-1 Head Set is also available as an option for use in high-noise areas.

367X501 Model 501 Locating System1-2, \$599.00 ea.; 3-up, \$559.00 ea.
367X750 HS-1 Optional Head Set50.00 ea.

Models 508 and 508E

Cable Locator Systems

- Tracks underground or within walls
- Can determine depth of lines
- Compact and battery powered
- Choose from two models

The lightweight 508-Series cable locator systems are used to find, track and determine the depth of buried or hidden cables, wire or pipe. They consist of a transmitter and a receiver, conveniently packaged together in a durable ABS carrying case. The receiver has a tracking antenna attached to the end of a short length of cable. By attaching the leads of the transmitter to the cable, wire or pipe being traced, it is possible to follow the path of whatever is being located by gently swinging the antenna of the receiver over the suspected path until there is a null. All that is necessary then is to follow the nulls and track the path. Further, the systems utilize a silent RF locating tone that minimizes interference to other circuits. The transmitter is also protected against ac voltages.

Specifications include: weight (3 pounds), dimensions (7.5" x 3.5" x 10"), length (locates distances up to 1000'), depth (locates up to 3' underground). Operates on two 9-V batteries (not supplied), which give approximately 100 hours of operation.

Choose from two models. The standard Model 508 is used for locating inactive wires and pipes underground or in walls, ceilings and false floors. The new Model 508E is designed to locate the path of energized as well as de-energized wires behind walls, in ceilings and underground by utilizing the supplied adapter that plugs into an electrical outlet. This simple process enables the user to identify a specific circuit breaker quickly, pinpoint wires before drilling and verify dig sites underground. The unique ac plug adapter makes access to receptacles not only very easy but safe. Caution should be taken, however, not to use the 508E on live circuits exceeding 120 V.

367X508 Model 508 Standard Locator1-5, \$185.00 ea.; 6-up, \$169.00 ea.
367X510 Model 508E Energized Locator1-5, 209.00 ea.; 6-up, 189.00 ea.

**PROGRESSIVE
ELECTRONICS INC.**



Model AT-2004

Industrial Multipurpose Tracing System

- Trace and identify conductors, load-side equipment, line-side wiring
- Locate ground faults and shorts
- Identify individual wires in a bundle

Model AT-2004 Wire Tracing System is an electrician's dream. It is designed for use on energized and unenergized conductors whether broken or in a complete circuit. All the benefits of Amprobe/Pasar's Current Tracers and Open Tracers are combined in one versatile, affordable package that offers enhanced performance. This advanced system traces conductors that are hidden or buried up to 13 feet. Use it to find ground faults, opens and shorts as well as identify individual wires, breakers and switchgear.

Trace and identify load-side equipment from circuit breaker while energized. Use four-piece set to trace line-side wiring without power interruption on circuits of 9-600 volts ac or dc. Trace open wires up to two miles, wire in conduit or even the conduit itself. Locate ground faults and shorts plus identify individual wires in a bundle.

S2600 Load Signal Generator enables tracing on energized circuit. Operating at 9-600 volts ac or dc with 32.768-kHz frequency, it transmits two pulses with duration of .0625 each every .5 seconds. In low mode, current output is 35 mA peak and 4 mA average. In high mode, current output is 70 mA peak and 6 mA average. R2000 Receiver features electromagnetic coil pickup for short mode with performance of over 20 feet in air under test conditions. Open mode features electrostatic

plate pickup with performance of over 12 feet. R2000 has 10-LED display with chroma filter lens. Powered by 9-volt alkaline battery.

T2200 Transmitter enables tracing open or unenergized circuit. With operating frequency of 32.768 kHz, it transmits two pulses with duration of .0625 every .5 seconds. Powered by 9-volt alkaline battery. A2201 Clamp-on Transmitter lets T2200 place signal onto energized line.

The B2024 24-V ni-cad rechargeable Battery Booster triples T2200's output. Use B2025 115-V ac/24-V dc Recharger/Converter with B2024 or to boost T2200.

All units are fully fused, protected and intrinsically safe. Includes two test lead sets with instructions in a black ABS case. The 11" x 5.5" x 4" case is 4.4 pounds with contents. One-year warranty.

AT-2004 Tracing System

008X009.....1-2, \$793.00 ea.; 3-up, \$746.00 ea.

B2024 Battery Booster

008X010.....\$109.00 ea.

B2025 Recharger/Converter

008X011.....\$31.00 ea.



AMPROBE INSTRUMENT
DIVISION OF CORE INDUSTRIES INC

MetroTel
Corp



Cable Hound® Cable/Pipe Locator and Depth Indicator

Cable Hound® is an electronic device designed to locate and determine the depth of buried cable or metallic pipe accurately. Each Cable Hound® comes with a Transmitter, Receiver, Tone Probe, Ground Rod and an Operating and Service Manual all conveniently contained in a highly visible orange plastic case.

The transmitter, powered by eight C batteries (not included), is an integral part of the carrying case. It produces a steady or warbled 2700-Hz tone, user selectable via a control switch. Two clip leads approximately 15 feet long are used to place the transmitter between the ground rod and the cable shield or sheath electrically. The receiver is a sensitive solid-state amplifier powered by a 9-volt battery (not included) in a durable plastic housing. Equipped with volume control and 60-Hz filter to prevent ac induction, it is tuned to 2700 Hz. Cable Hound will reproduce a steady or warbled tone.

Both the transmitter and receiver have battery condition indicators. The tone probe acts as a directional antenna which picks up the transmitted tone. It is encased in molded rubber and has a bubble level for accurate depth determination. The tone probe is connected to the receiver by a 6-foot plug-ended cable.

71-620-10 Cable Hound

610X620.....1-5, \$263.00 ea.; 6-up, \$250.00 ea.

NEXT-DAY DELIVERY
ONLY \$14.95!



Model 4 Loop Tester

Deluxe Four-in-One Transmission Test Set

Model 4 Loop Circuit Tester is a unique general-purpose instrument designed primarily for use in local exchange and special service areas to perform most daily testing requirements. It incorporates a transmission test set for measuring line loss, CKT noise and dc loop current; a tone generator with selectable frequencies and adjustable output amplitude; a dc and ac voltmeter for routine voltage measurements; and ohmmeter with five ranges capable of measuring less than 1 Ω to greater than 1 M Ω . Model 4 replaces up to four separate instruments normally used by telephone professionals (transmission test set, signal generator, volt/ohmmeter and 8455 tester).

Specifications include capabilities for testing: circuit loss (-40 to +3 dBm); circuit noise (0 to 33 dBnc); power influence (60 to 93 dBnc); dc loop current (0 to 100 mA dc); tone generator (frequency/tones include: 204-304-404-575-750-1754-1804-2004-2804-3004-3204-4804 plus 804-1004-2713 and two that can be customer specified); dc volts (15-300 V), ac volts (60-300 V); resistance; and ohms (five ranges 1 Ω to 100 k Ω).

Includes 60" color-coded test lead set (14" modular plug receptacle to three WECO-style insulated alligator clips coded tip, ring and ground), standard VOM test leads, deluxe integral carrying case with strap, batteries, spare fuse and extensive instruction manual. The 5-pound unit measures 5.5" x 7.5" x 5".

090X004 Model 4 Loop Tester.....1-5, \$535.00 ea.; 6-up, \$519.00 ea.



Model 5 Digital Loop Tester

Triplett Model 5 Loop Tester is a general-purpose instrument combining the test capabilities most needed by installation and repair personnel. It features a digital readout surrounded by a color-coded label which gives the most used color-coded limits for transmission tests. In addition to the loop test functions, an ac/dc voltmeter and ohmmeter are included as well as a tone generator with 15 switch-selectable tones. The variable tone generator output dB level can be monitored by the digital readout.

This unit is supplied in a rugged plastic case with a removable cover compartment used to store test leads and the operator's manual. It even has an adjustable carrying strap so it can be carried with hands free. Includes 310 jack to modular plug lead, modular receptacle to three



Weco alligator clips, standard VOM leads, adjustable shoulder strap, batteries, spare 1A fuse and operations manual. The 3.5-pound unit measures 5.5" x 7.5" x 4.9". Three-year warranty.

090X005 Model 5.....1-2, \$580.00 ea.; 3-up, \$562.00 ea.

TRIPLETT

Model 5 Specifications

Transmission Test Set:	Multi-Tone Generator:	Volt-Ohmmeter:
Circuit Loss/Noise:	Waveform: Sine Wave	Voltage dc: 0.01-20 V, 0.1-200 V
Range: -40 to +10 dBm	Frequencies: (15)	Voltage ac: 0.01-20 cV, 0.1-200 V
0 dBm Reference: 1 mW across 600 Ω	204-4804 Hz	Input Impedance: 1 M Ω
Input Impedance: 600 Ω	Tone Output: Available at V- Ω jacks when SW is set on CKT Loss. Also at Line Jack when Send/Receive Switch in Send position	Resistance: (3) 200, 2 k, 2 M Ω
Varistor Surge Protector		Overload Protection: 1 A
Tone Output: Transmitted through test leads		

TEL TONE

ILS-A-01 ISDN Line Simulator

The Teltone® ILS-A-01 is a portable, stand-alone, end-to-end ISDN Basic Rate Interface (BRI) Central Office Simulator. This is the most affordable and convenient way to develop, test and demonstrate ISDN-BRI products designed for U or S/T interfaces including network termination, Type 1 terminating equipment and terminal adapters. Avoid the trouble and expense of specifying ISDN services and buying protocol analyzers. Demonstrate physical layer, data link layer and network layer operations during multiple, real-time voice or data calls — on your desktop.

The ILS-A-01 is simple for anyone to operate yet powerful for design and testing. It begins simulation when powered on and requires no set up, making it ideal for trade show or on-site customer sales presentations. It also serves as an affordable development and troubleshooting tool. Test or demonstrate ISDN-BRI products anytime and anywhere. If you can imagine it, ILS-A-01 can do it. Simulate end-to-end, real-time ISDN-BRI calls. Perform complete call handling procedures without a switch, PBX or P-based development system, eliminating variables and problems inherent in testing with real ISDN lines. Demonstrate ISDN-BRI terminating equipment and computer applications. Use it at trade shows, sales demos and training courses so your audience can see your product's best performance, not a subscription limit or faulty line installation. Monitor physical layer status and control parameters. Observe go/no go indications of physical layer characteristics such as synchronization, loop back and power. You can test proprietary message types and information elements. Test and demonstrate



ILS-A-01 Features

- Two ISDN-BRI (2B+D) lines for end-to-end simulation
- U (2B1Q) and S/T (ASI bipolar) interfaces at each line
- Speech, 3.1 KHz audio, 7 kHz audio, Circuit Mode Data and D Channel Packet Mode Data
- Point-to-point and point-to-multipoint configurations
- In-band tones and primary line power to six terminating devices
- Supports National ISDN-1, AT&T call control messages, information elements
- Supports auto-initializing terminals including AT&T Management Information Messages (MIM)

features unique to your product, using switch-specific messages and locking shift or user-to-user information elements.

The ILS-A-01 supplies telephony services you would expect from an ISDN PBX or Central Office switch. Appropriate in-band tones are applied to voice calls. Dialing treatments and network timing procedures are performed. Time Slot interchange technology routes Speech and Circuit Mode Data (CMD) connections on either B Channel while D Channel Packet Handling Function (PHF) simulates X.25 Packet Mode Data (PMD) calls. Predefined Service Profiles ID's (SPID) auto-initialize Directory Numbers and assign Service Profiles that permit unlimited call types, multiple call appearances, caller ID and other supplementary services. ISDN Type 1 Terminating Equipment (TE-1) or Terminal Adapters (TA) may be connected directly to the S/T interface. Up to six devices may be configured point to multipoint through a Network Termination-1 (NT-1) at the U interface or a passive bus arrangement at the S/T interface. Either line interface or configuration may be used in combination.

The 4.2-pound unit measures 10" x 8.5" x 2.3". Two-year warranty.

665X400 ILS-A-01.....1-2, \$2495.00 ea.; 3-up, \$2370.00 ea.



Four-Line Test Line Simulators

Portable Teltone Telephone Line Simulators offer flexibility in telecommunications product demonstration and testing. Models TLS-5A-02 and TLS-5C-01 are top-of-the-line four-line versions while TLS-4A-01 is the basic four-line model. By simulating public network and PBX features, you can set up calls between four different devices to perform as if they went out over actual phone lines. You will never need to install extra phone lines for equipment demonstrations. All this power comes in a single, portable unit.

Dual talk paths are provided for two simultaneous, independent conversations plus audio input/output port for playing and recording messages. Generate precise call progress tones and support loop start signaling with -48 V battery feed that simulates C.O. lines. Use four front panel modular RJ11 jacks for connecting user equipment (for demonstrations or telecom testing), multifunction switch and LEDs that quickly display line status. Five-pin DIN jack on back panel enables sending or receiving audio to/from any line. Fused, switched modular ac power jack and optional chassis ground reference point are located on back of unit.

Use line simulators for applications as diverse as 911 dispatcher training, bench testing telephone equipment, checking office phone lines before central office lines have been connected plus demonstrating and testing FAX machines, phone sys-

tems, modems and other telecom equipment. Set up a wide variety of user-programmable demonstration or test situations. Assign up to 16-digit unique primary and secondary numbers to each line. Set distinctive ring cadences for each secondary number. Ring multiple devices simultaneously with a single call by assigning the same number to all lines, or set up lines in hunt groups. Calls can be transferred, placed on hold or conferenced. Program a "hot line" to ring a designated station automatically when handset is lifted. Set up a simulated PBX with "dial 9 for outside lines" option. Simulate a PBX hunt group with "ring all," "ring first" or "ring next" features with multiple lines set to the same number.

Other programmable features include flash detection, line sound volume, responses to busy signals or non-valid numbers, dial tone and network response delays, voice response query to find setting for any programmed feature and selectable ringing frequency. Line simulators provide sine wave ringing voltage for accurate testing of FAX machines, modems and other equipment with sensitive ringing detectors. Forced disconnect cuts off caller or called party after programmable delay.

Choose from three four-line Simulator models with 7.5-foot ac power cord and manual. Each 4.2-pound unit is 10" x 8.5" x 2.3". Two-year warranty.

Specifications	TLS-5A-02	TLS-5C-01	TLS-4A-01	TLS-3A-01	TLS-3B-01
Four Synthesized Phone Lines	✓	✓	✓		
Two Simultaneous Dialing and Talk Paths	✓	✓	✓		
Programmable Dialing of Any Number Combination	✓	✓	✓		✓
Loop Start Operation, -48 V Battery Feed	✓	✓	✓		
PBX/CO Features	✓	✓	✓		
Caller ID	✓	✓			✓
Caller ID in Call Waiting		✓			
Visual Message Waiting					✓
Compact Briefcase Size				✓	✓



TLS-5 Models

Telephone Line Simulators with Caller ID

The TLS-5A-02 generates Caller ID information in Bellcore-specified single and multiple data message formats. Information includes calling number, caller name, date and time of call. For more complete testing, it simulates privacy blockage, out-of-area calls and transmission errors. Primary phone number programmed for each line is displayed as calling number; Caller ID name is delivered from three possible choices for each line. The first two are hard-coded in firmware; the third is user-definable. Transmitted date/time messages are firmware-coded and unique for each message type.

Model TLS-5C-01 is a four-port telephone line simulator with additional features and enhancements. The added capability to simulate Caller ID in Call Waiting (CIDCW) will send the caller's name and number after the Call Waiting tone and display it on compatible CPE equipment. Enhanced CLASS programming features include Call Forwarding, Automatic Callback, Automatic Recall, Speed Dialing, Distinctive Call Waiting, Programmable Stutter Dial Tone and Unique Demonstration Modes.

665X300 TLS-5A-02 Four-Line Simulator1-2, \$715.00 ea.; 3-up, \$679.00 ea.

665X305 TLS-5C-01 Four-Line Simulator1-2, 799.00 ea.; 3-up, \$759.00 ea.

Model TLS-4A-01

Telephone Line Simulator

This basic model offers all the features of TLS-5A-02 except for Caller ID signaling. Optional 4.5-foot modular (RJ11) to color-coded alligator clip test cables connect it to 66-type or similar blocks (one test cable required for each line).

665X200 TLS-4A-01 Four-Line Simulator1-2, \$599.00 ea.; 3-up, \$569.00 ea.

665X150 TLS-CA1 Optional Modular to Alligator Test Cable (for all five models) ..\$20.00 ea.



Two-Line Test Line Simulators

Teltone's two-line simulators offer enhanced features for such compact models. Models TLS-3A-01 and TLS-3B-01 are fully programmable, have dial-up test tones, COD pulse and secondary dialtone. Testing and demonstrating telecom devices has never been easier. You get two realistic simulated central office lines in your choice of two low-cost, fully-featured portable units.

At 5.5" x 1.5" x 9", each 1.1-pound unit easily fits into a briefcase. Includes 7.5-foot ac power cord (unit is ac powered only), two 4.5-foot modular-to-alligator clip cables (for use with 66-type or similar terminal blocks) and operations manual. Two-year warranty.



Model TLS-3A-01

Telephone Line Simulator

TLS-3A-01 is cost effective with basic functions like precise call progress tones, tone and rotary dialing, dial-up test tones and secondary dial tone.

TLS-3A-01 Two-Line Simulator

665X1001-2, \$375.00 ea.; 3-up, \$356.00 ea.

Model TLS-3B-01

Telephone Line Simulator with Caller ID

Model TLS-3B-01 offers all the TLS-3A-01 features plus programmable primary/secondary phone numbers, network response delays, flash detect, forced disconnect, test tones, etc. It also has Caller ID signaling and Visual Message Waiting.

TLS-3B-01 Two-Line Simulator

665X1051-2, \$475.00 ea.; 3-up, \$450.00 ea.



Telesense 2000

Transmission Line Test Set

- Line hold circuit
- Variable generator level
- 20-kHz frequency counter

Telesense 2000 puts power in the palm of your hand. This new-generation heavy-duty, handheld transmission line test set is powerful, compact, tough and simple to operate. It will aid you in finding all transmission breakdowns. This versatile tester is user-friendly, eliminates calculations and provides optimal performance to simplify measurement tasks. It is intended for testing, installation or troubleshooting leased lines and dial-up circuits. Incorporating the latest technology and standards, it will provide exceptional performance and reliability.

Model 2000 is packed with advanced features. This high-performance yet affordable test set combines the functions of two instruments in one compact unit. Transmission impairment measuring set (TIMS) features include signal generator with impedance and level control, frequency counter, Rx impedance with level measurement and noise measurement plus holding current measurement. DMM features include dc and ac voltage, resistance with audible continuity and dc current.

All functions are easily accessed through a rotary selector switch. A level control dial is provided for the precision signal generator. Auto-ranging measurements are constantly monitored via a 3.5-digit LCD. Make true-rms level measurements of -60 to +10 dBm and 600/900 Ω terminated or high-impedance measurements (bridge mode ≈ 100 k Ω). It also includes a 20-kHz frequency counter, dual Bantam miniature phone jack and RJ11 modular jack for accurate testing plus low-battery indicator.

The Telesense 200 was designed with weight, portability and ruggedness in mind. It is lightweight enough to carry anywhere without burden and compact enough to fit easily in any tool belt or pocket. This test set survives drops of up to 4 feet and can endure any environmental threat. In addition to withstanding the frequent drops and bumps of everyday tasks, the rugged ABS plastic case keeps the test set contaminant free. Model 2000 meets or exceeds IEEE743, BELL pub41009 and CCITT Standards.

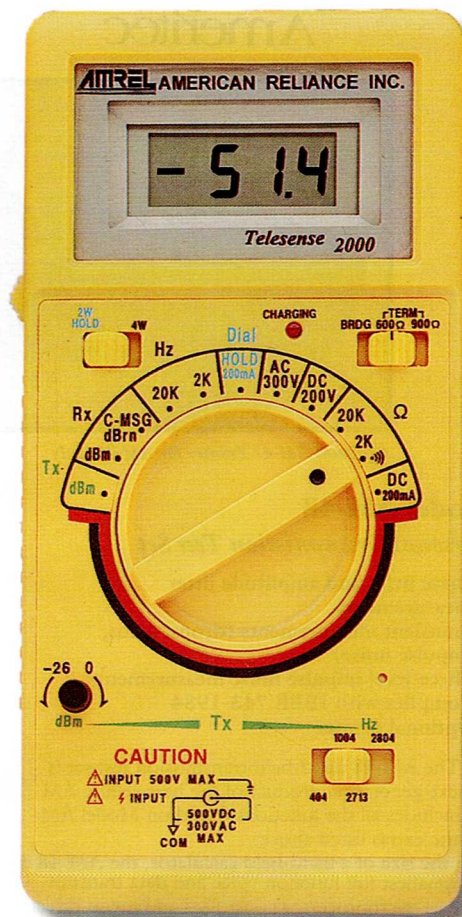
Includes removable stand, two 3-foot Bantam alligator leads, 9-volt dc alkaline battery, hard leather carrying case and manual. At just 12.4 ounces with battery, it measures 6.9" x 3.4" x 1.4". One-year warranty.

Model 2000

570X3501-5, \$595.00 ea.; 6-up, \$565.00 ea.

Telesense 2000 Specifications

Level Measurement	-60 to +10 dBm
Noise Measurement	-80 to 0 dBm
RX Impedance	600 Ω /900 Ω
Bridge Impedance	≈ 100 k Ω
C-MSG Filter	Yes
Tone Generator	404/1004/2713/2804 Hz
Generator Level	Variable 0 to -26 dBm
TX Impedance	600 Ω /900 Ω
Line Hold Circuit	✓
Loop Back Capability	✓
Frequency Counter	✓
DMM Functions	✓
Audible Continuity	✓
Oversized LCD	✓
I/O Connectors	Bantam/RJ11



Telesense 1000

Transmission Line Test Set

- Finds all transmission breakdowns
- Tone generator with selectable -13 dBm and 0 dBm output levels
- 20-kHz frequency counter

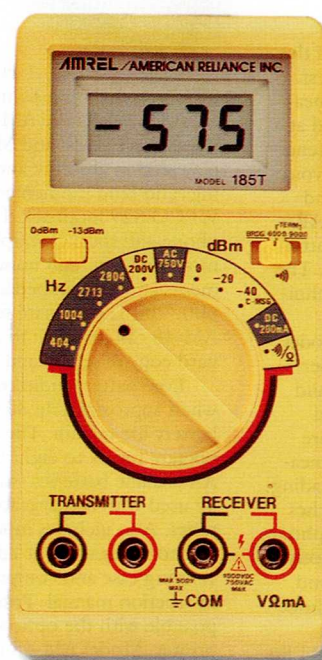
This new-generation telecom test set is powerful, compact, tough and simple to operate. The portable Telesense 1000 aids you in finding all transmission breakdowns. Test, install or troubleshoot leased lines and dial-up circuits. Incorporating the latest technology and standards, its superior quality and features will provide exceptional performance and reliability.

A heavy-duty hand-held transmission line test set, Telesense 1000 optimizes your testing requirements. A precision tone generator has selectable output levels of -13 and 0 dBm.

Perform true-rms level measurements from -50 to +8 dBm. Measure 600/900- Ω terminated or higher impedance (bridge mode ≈ 1 M Ω). A 20-kHz frequency counter is also provided. This versatile digital multimeter performs voltage, current and resistance measurements as well.

The 1000 meets or exceeds IEEE743, BELL pub41009 and CCITT standards. Its ABS plastic case withstands drops up to 10 feet. This tester is powered by a 9-volt dc alkaline battery. It weighs just 12.4 ounces with battery and measures 6.9" x 3.4" x 1.4". One-year warranty.

570X300 Model 10001-5, \$495.00 ea.; 6-up, \$470.00 ea.



Telesense 185T

Transmission Line Test Set

- Performs basic tests including line loss, noise or level measurements
- DMM functions
- Low price

The Telesense 185T is powerful, compact, tough and simple to operate. This heavy-duty, hand-held instrument aids you in finding all transmission breakdowns. Intended for testing, installing or troubleshooting leased lines and dial-up circuits, it helps find all transmission breakdowns. Incorporating the latest technology and standards, this versatile test set will provide exceptional performance and reliability.

AMREL's portable 185T performs basic tests including line loss, noise or level measurements. It also features a balanced tone generator,

C-message weighting filter, termination mode and bridge mode. The versatile instrument is equipped with such useful DMM functions as voltage, current and resistance measurements. All its functions are easily accessed through the rotary selector switch.

Model 185T meets or exceeds IEEE743, BELL pub41009 and CCITT standards. The sturdy ABS plastic case withstands drops up to 10 feet. This tester is powered by a 9-volt dc alkaline battery. It weighs just 12.4 ounces with battery and measures 6.9" x 3.4" x 1.4". One-year warranty.

570X185 Model 185T1-5, \$345.00 ea.; 6-up, \$328.00 ea.



Model AM-44

Personal V.F. Test Set

- Tests two- and four-wire voice or data telecom circuits
- Sends and measures signals simultaneously
- Complies with BSTR 41009

Designed for personal or field testing, the AM-44 Test Set is used for conducting analog transmission impairment measurements on two- or four-wire voice or data telecommunications circuits. It includes signal measurement and signal generating capability that operates full duplex, sending and measuring simultaneously. The AM-44 contains built-in DTMF, MF and rotary dial (pulse) capability for direct operation on two-wire dial-up circuits. The keypad can be used to DTMF Command Ameritec two-wire or four-wire responders.

A very precise instrument, the AM-44 measures signal level (loss/gain), frequency, frequency shift, idle channel noise with C-message (or psophometric filter) or 3-kHz flat filter, noise with tone using C-message (or psophometric filter) and notch filter, signal-to-noise ratio with direct readout in dB and the P/AR (peak to average ratio) benchmark test.

Other unique features include relative measure mode which lets level display be zeroed at a particular reading and fully variable signal generator to allow any frequency or level within voice-band to be set easily. Selection of preset send conditions includes 1004 Hz, QUIET, P/AR and SLOPE. Momentary send 2713-Hz button actuates Bell Model 829 Loopback devices. The AM-44 fully complies with Bell System Technical Reference (BSTR) 41009.

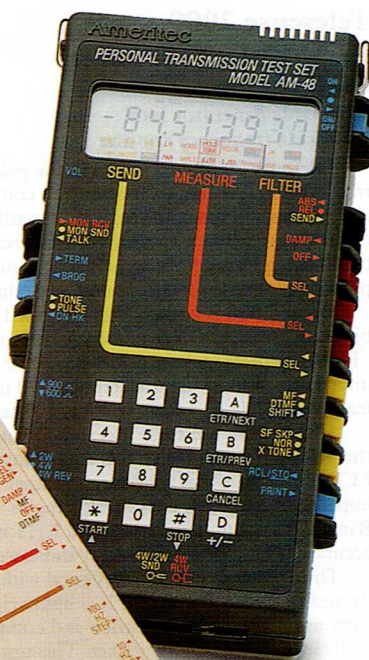
Despite all these impressive features, Model AM-44 remains very compact and easily operated. Simply use the color-coded controls and menu selection to choose measure and send modes. The proper units of measurement are automatically displayed, and auto ranging measurement circuitry automatically displays reading. All controls are edge-mounted rocker switches or slide switches. A built-in speaker/microphone enables one tester to communicate with another over the line under test (no need for a second line). The AM-44 utilizes dual miniature phone jack inputs and RJ11C Modular Jack Input.

About the size of a calculator, the AM-44 fits easily in your tool kit. At only 26 ounces with batteries, it is 4.2" x 7.6" x 1.7". Powered by four 1.5 AA alkaline batteries (furnished) or external ac adaptor (also supplied). Comes complete with line cords, deluxe carrying case and comprehensive operations manual. One-year warranty.

AM-44

480X044

1-2, \$2105.00 ea.; 3-up, \$1995.00 ea.



Ameritec



Optional AM-47 Printer for AM-48 Only

Model AM-48

Personal Transmission Test Set

- Phase jitter and amplitude jitter measurements
- Transient measurements (drops, gains, impulse noise)
- Three-level impulse noise measurements
- Complies with IEEE 743-1984
- Optional printer

The AM-48 hand-held transmission test set is the next-generation product of the best-selling AM-44. It includes all the functions found on Model AM-44 plus the extras listed above.

About the size of a hand-held calculator, the AM-48 is the world's smallest full function voice and data transmission test set. It is microprocessor controlled and menu driven for simple, easy-to-use operation. Further, it is capable of sending frequencies from 200 Hz to 20 kHz (+10 to -50 dBm), sending continuous three-tone slope (404, 1004, 2804 Hz), sending a fixed tone of 1004 Hz and P/AR waveforms.

Use the AM-48 to measure level and frequency (+10 to -65 dBm), idle channel noise, noise with tone, three-level impulse noise, phase jitter, gain jitter, transients (dropouts, phase and gain hits, impulse noise), signal to noise and P/AR.

Additionally the AM-48 offers many other features such as built-in butt set with the ability to dial in pulse plus DTMF and MF. It can display level in absolute and relative readings and send momentary 2713 Hz for WECO 829 loopback. Includes microphone and speaker, earphone for audio monitoring in high noise environments and high-impedance bridge or 600/900-Ω terminate selection. The AM-48 can interface to a printer for hard copy of set-up and test results.

Low-battery indicator alerts user when approximately 30 minutes of battery life remain. The AM-48 will operate for six to eight hours on four AA alkaline batteries (supplied) or can be used with rechargeable ni-cad batteries. Also includes input cable (modular to minigator), ac adaptor, carrying case and comprehensive instruction manual. Printer output is possible with the optional AM-47 printer. Model AM-48 is truly a major technological innovation in portable transmission test sets. At just 26 ounces including batteries, it is 4.2" x 7.6" x 1.7". One-year warranty.

AM-48 Test Set

480X048

1-2, \$3165.00 ea.; 3-up, \$2995.00 ea.

AM-47 Printer

480X047

.....\$525.00 ea.

	Ameritec AM-44	Ameritec AM-48
Transmit Frequency	200 Hz to 5 kHz	200 Hz to 20 kHz
Transmit Level	+10 to -50 dBm	+10 to -50 dBm
Transmit 2713	✓	✓
Transmit Slope	✓	✓
Transmit Sweep	✓	✓
Transmit SF Skip	✓	✓
Receive Frequency	200 Hz to 5 kHz	200 Hz to 20 kHz
Receive Level	+10 to -65 dBm	+10 to -65 dBm
Noise Filters	C-Message 3 kHz	C-Message 3 kHz, 15 kHz
Noise Measurement	✓	✓
Noise with Tone	✓	✓
Noise to Ground	✓	✓
Signal to Noise Ratio	✓	✓
Impulse Noise	✓	✓
P/AR	✓	✓
Phase Jitter	✓	✓
Gain Jitter	✓	✓
Hits Measurement	✓	✓
Return Loss	✓	✓
Dial Method	DTMF Pulse, MF	DTMF Pulse, MF
Line Hold	✓	✓
Termination Impedance	600, 900	600, 900
Bridge Termination	✓	✓
Microphone	✓	✓
Speaker	✓	✓
DMM Function	✓	✓
Printer Output	✓	✓



Model 186-T

Transmission Line Test Set

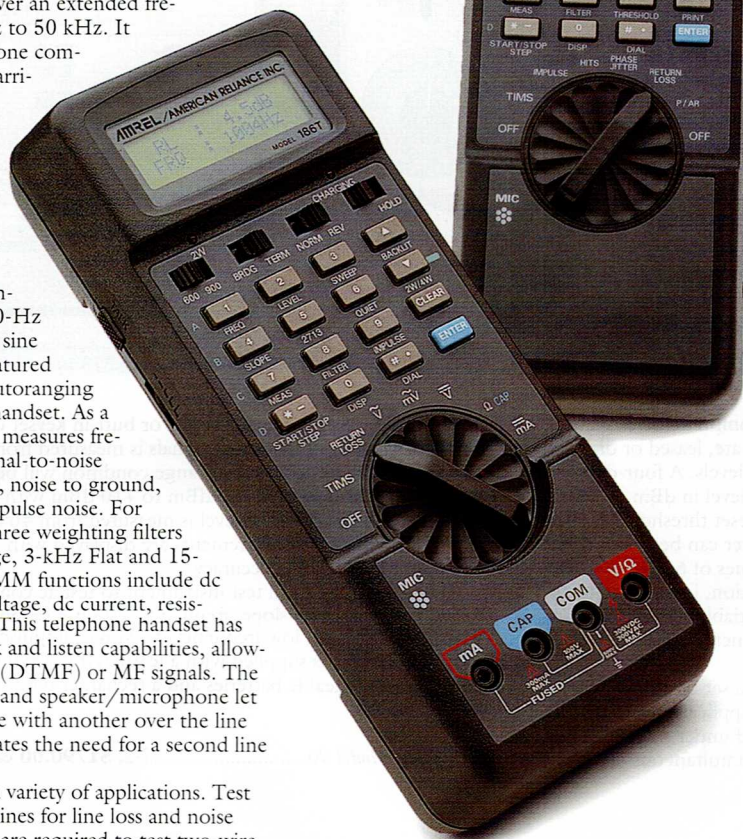
- Four test instruments in one
- TMS, autoranging DMM, telephone handset
- Complies with IEEE 743-1984 (Bell standard 41009)

The 186-T is a hand-held transmission test set that is full featured yet competitively priced. Fully compliant with IEEE 743-1984 (Bell Standard 41009), Model 186-T is designed for field testing voice and data telecom circuits over an extended frequency range of 20 Hz to 50 kHz. It is ideal for local telephone companies, long distance carriers, audio equipment repair centers and local area network/wide area network maintenance.

Model 186-T conveniently combines the functions of four test instruments in one compact unit. It features 20-Hz to 50-kHz synthesized sine wave generator, full-featured transmission test set, autoranging DMM and telephone handset. As a transmission test set, it measures frequency, dBm level, signal-to-noise ratio, return loss, noise, noise to ground, noise with tone and impulse noise. For noise measurements, three weighting filters are available: C-Message, 3-kHz Flat and 15-kHz Flat. True-rms DMM functions include dc voltage, true-rms ac voltage, dc current, resistance and capacitance. This telephone handset has built-in dial, redial, talk and listen capabilities, allowing for dial pulse, tone (DTMF) or MF signals. The built-in dc hold circuit and speaker/microphone let one tester communicate with another over the line under test. This eliminates the need for a second line or external butt set.

Use the 186-T for a variety of applications. Test four-wire transmission lines for line loss and noise level. Two 186-T units are required to test two-wire

ARI



Model 188-T

Transmission Line Test Set

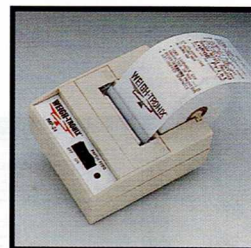
- Three-level impulse noise/phase jitter/gain hit/phase hit measurement
- P/AR measurement
- RS232C printer interface and optional portable printer

Model 188-T provides the same hand-held convenience as the 186-T but offers many additional features for field testing voice and data telecommunication circuits in the 20-Hz to 50-kHz range. It is ideal for local telephone companies, long distance carriers, audio equipment repair centers and local area network/wide area network maintenance.

Consider the comprehensive printer capabilities offered. An RS232C printer port permits connection to IMP-24 series portable printer for hard copy output. Simply press print key to print out either data setup or results shown on LCD. During a period testing (transients measurement), it will print out automatically every five minutes and at the end of the period. Optional printer can be a real time saver and documentation aid. Other exclusive features are phase jitter measurement, impulse and hits measurement and peak to average ratio measurement. These features allow the user to send a fixed tone of 1004 Hz and P/AR waveforms. It is fully compliant with IEEE 743.

Combining the functions of four test instruments in one, this compact unit features 20-Hz to 50-kHz synthesized sine wave generator, full-featured transmission test set, autoranging DMM and telephone handset. As a transmission test set, it measures frequency, dBm level, signal-to-noise ratio, return loss, noise, noise to ground, noise with tone and impulse noise. For noise measurements, three weighting filters are available: C-Message, 3-kHz Flat and 15-kHz Flat. True-rms DMM functions include dc voltage, true-rms ac voltage, dc current, resistance and capacitance. Telephone handset has built-in dial, redial, talk and listen capabilities, allowing for dial pulse, tone (DTMF) or MF signals. The built-in dc hold circuit and speaker/microphone let one tester communicate with another over line under test. This eliminates the need for a second communications line or external butt set.

Use the 188-T for a variety of applications. Test four-wire transmission lines for line loss and noise level. Measure signal-to-noise ratio in transmission lines. Test frequency response of audio frequency filters plus proper termination and return loss of transmission lines. Detect location of opens/shorts in transmission lines. Model 188-T comes complete with four 5-foot-long Bantam cables, ac charger (110/120 V, 60 Hz), operation/maintenance manual and carrying case. The 188-T weighs in at less than 2.5 pounds and measures 10" x 4.2" x 2.5". One-year warranty.



570X188 188-T Test Set

1-2, \$2945.00 ea.; 3-up, \$2799.00 ea.

188-PRNT Printer

570X187\$299.00 ea.

lines. Measure signal-to-noise ratio in transmission lines. Test the frequency response of audio frequency filters plus the proper termination and return loss of transmission lines. Detect location of opens/shorts in transmission lines. Model 186-T is a frequency generator and frequency counter. It may be used to communicate over a two-wire transmission line.

Hold this complete analog and digital test set in the palm of your hand. All menu-driven functions are easily accessed through the front numeric keypad. In quiet mode, signal generator is disconnected and line is terminated with selected impedance. Slope frequency mode cycles continuously between 404 Hz, 1004 Hz and 2804 Hz with 5 seconds at each tone. A single key generates 2713-Hz tone to activate remote 829-type loopback devices.

Model 186-T has a 16 x 2 LCD with backlight and adjustable speaker volume. It is powered by eight four-hour AA ni-cad or alkaline batteries with auto power-off. Includes RJ-45 modular jack, dual bantam miniature phone jacks, ac/dc converter, test leads, batteries, carrying case and manual. The 186-T weighs 2.2 pounds with battery and measures 10" x 4" x 2.5". One-year warranty.

186-T Test Set

570X186

1-2, \$1969.00 ea.; 3-up, \$1850.00 ea.

AMREL 186-T	AMREL 188-T
20 Hz to 50 kHz	20 Hz to 50 kHz
+10 to -50 dBm	+10 to -50 dBm
✓	✓
✓	✓
✓	✓
✓	✓
20 Hz to 20 kHz	20 Hz to 50 kHz
+10 to -60 dBm	+10 to -60 dBm
C-Message 3 kHz,	C-Message 3 kHz,
15 kHz	15 kHz
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
DTMF Pulse, MF	DTMF Pulse, MF
✓	✓
600, 900	600, 900
✓	✓
✓	✓
✓	✓
✓	✓



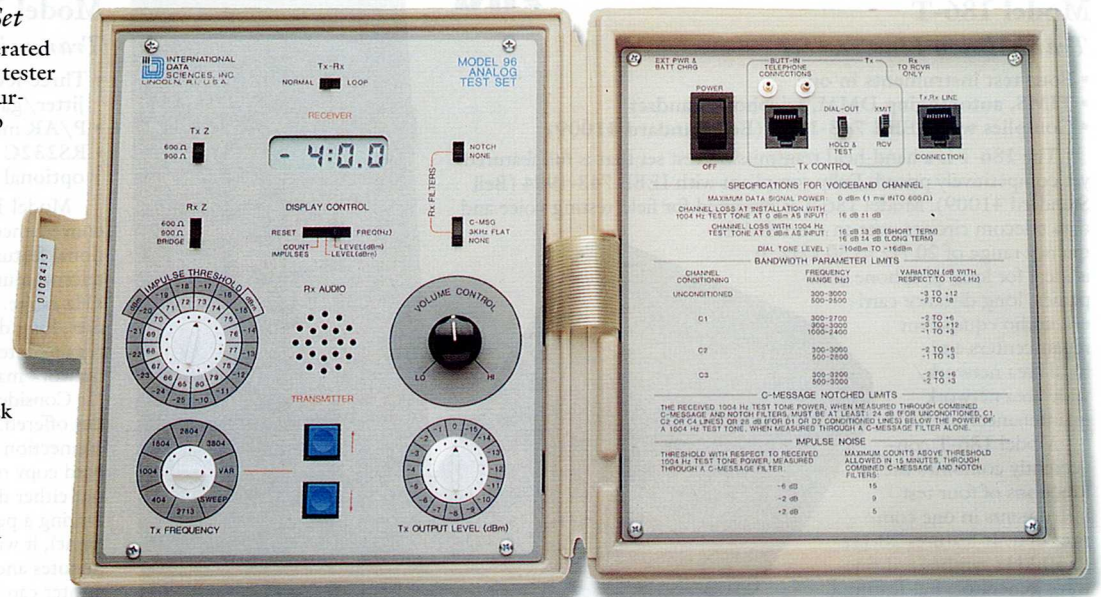
Model 96

Comprehensive Analog Test Set

- Lightweight portable battery operated or power unit charger hand-held tester
- Designed for use over two- or four-wire leased, private or the dial-up switched network
- Four-digit LCD displays frequency, impulse count, power level, dBm level or dBm level
- Can generate frequency from 256 Hz to 8190 Hz
- Automatic Sweep frequency test
- Fixed frequency settings of 404, 1004, 1804, 2804, 3804 and 2713 Hz
- Built-in butt-in keyset telephone connection post and/or RJ45 jack
- Built-in standard WECO type 310 jacks
- Real holding coil
- Second RJ45 jack allows simultaneous use of butt-in keyset and dial-out handset
- Up to 16 threshold settings
- Speaker and volume control for audio monitoring

The compact, portable and versatile Model 96 Comprehensive Analog Test Set can test all two- or four-wire, dedicated, private, leased or dial-up lines. It can monitor audio signals and measure their levels. A four-digit LCD provides either a reading of the received signal level in dBm or dBm, frequency in Hertz or impulse counts exceeding a preset threshold. A 1010-Hz notch filter, a C-Message filter or a 3-kHz flat filter can be inserted into the receive signal path. Receiver input impedance values of 600 ohms, 900 ohms or Bridge may be selected. The transmitter section, in addition to the six fixed frequencies and sweep settings, also has a variable setting which connects to two slow/fast throttle push-buttons for increasing or decreasing the frequency.

Dial-up capability is provided by an RJ45 jack or a set of butt-in studs. The transmit jack can be used for switched network applications. It can be connected to either the 96 transmitter or receiver and under test is not lost during a switch. A second RJ45 jack is provided for simultaneous dial out



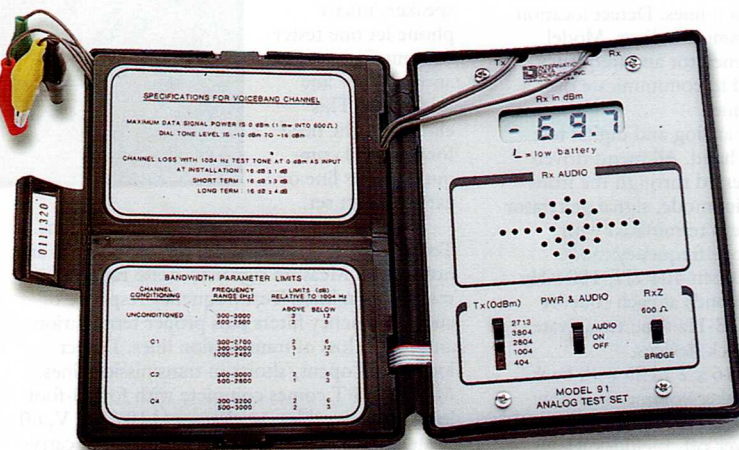
capability with both a regular keyset or butt-in keyset or for single keyset use.

The frequency of incoming signals is measured from 0-9999 Hz. Should four digits be exceeded, an overrange condition will be activated. The voltage level is measured from -50 dBm to +10 dBm with a ± 5 dB variation. When measuring noise, the level is measured from 40 dBm to 90 dBm with a ± 5 dB. Frequency measurements are displayed with 1-Hz resolution and have better than a 1-Hz accuracy.

Model 96 is the ideal test instrument to test ac continuity, channel loss (round trip loss), gain slope, frequency response graph, background noise (with/without tone, low frequency, C-MSG), impulse noise and loopback tests. This test set is supplied with a leatherette carrying case, eight nickel cadmium rechargeable batteries and a recharger plug-in power module.

420X096 Model 96.....1-2, \$1790.00 ea.; 3-up, \$1680.00 ea.

INTERNATIONAL
DATA
SCIENCES, INC



- Transmits tones of 404, 1004, 2804 and 3804 Hz
- Provides 2713-Hz tone for activating Bell 829 Loopback Device
- Measures and displays received signal levels
- Speaker provides audio monitor of line signals

- Small, battery operated and lightweight
- Tests all leased or dedicated two- or four-wire telephone lines
- Contains both a transmitter and a receiver

Model 91

Analog Test Set

Model 91 is a powerful, hand-held, battery-operated analog test set designed for use on two- or four-wire leased and dedicated lines. Data communications problems can be quickly identified with the multiple capabilities of the Model 91.

Included in this test set are necessary features for the detection of communications problems such as line breaks, power loss, noise or other factors which may distort or even interrupt the transmission of data. Equipped with both a transmitter and receiver, this unit allows the user to display the received signal level visually on a four-digit liquid crystal display (LCD) and monitor received signals audibly with a speaker.

Model 91 can be used in a variety of applications. Data derived from attenuation measurements can be used to construct a frequency response graph, a visual indication of channel quality. It also can provide a quick line continuity test which indicates if a line break has occurred. In addition, it is capable of channel loss and round trip loss measurements which help to determine signal degradation, an indication of channel problems. Model 91 even allows bridging of a line to monitor signal levels which is useful for setting modem transmit levels.

The case is color-coded brown for identification and made of high-impact plastic, providing maximum durability for field service use. It is so compact that it easily fits into the palm of your hand. A rechargeable battery-powered version is available as an option (specify Model 91R).

Model 91

420X0911-5, \$390.00 ea.; 6-up, \$367.00 ea.

Model 91R (Rechargeable Batteries)

420X0921-5, \$445.00 ea.; 6-up, \$418.00 ea.

NEXT-DAY DELIVERY
ONLY \$14.95!



Model VNA-70A Voice Network Analyzer

*Now with Ohms
Measurement to 25k Ohms*

Performs 8 vital test functions:

- Digit Grabber — CPE and DID
- AC voltmeter
- DC voltmeter
- Ohmmeter — DC and Loop
- Dc milliammeter
- True rms dB meter
- Audio frequency counter
- 1004 Hz; 0 dBm tone generator

A revolutionary new Voice Network Analyzer test set that effectively bridges the gap between general-purpose multimeters, ohm meters and expensive transmission measuring equipment, the VNA-70A Digit Grabber is a full function tester designed especially for the telecom field technician. Use it to troubleshoot local loops, inside circuits, telephone sets and peripherals such as FAX machines and voice mail systems. VNA-70A provides quick, easy and accurate access to every vital phone line parameter — just connect it to a line and turn it on — it indicates ac and dc voltage, loop current, line polarity, dB level, dc and loop ohms and frequency — ALL AT THE SAME TIME!



VNA-70A Specifications

Function	Range
dc volts	±1 to 99.5 V dc
dc milliamps	±1 to ±99.5 mA dc
ac volts	3 to 125 V ac
Decibels	-44 to +4 dBm
dc ohms	0 to 25K ohms
Loop ohms	100 to 5K ohms
Frequency	15-Hz to 8-kHz
Tone generator	1004-Hz frequency

At high input levels, the dB scale autoranges to ac volts, providing TRUE RMS readings from -44 dBm to 125 volts ac.

A highly stable 1004-Hz tone generator and 600-ohm quiet termination are built-in to allow transmission loss display. Video reversal of the dB/ac V indicator serves as a reminder that the internal load is selected. The tone generator also makes a handy "buzz box" for identifying multi-line wire pairs.

True to its DIGIT GRABBER name, the VNA-70A offers extensive capability for monitoring dialed digits. The full-alphanumeric readout displays 32 digits at a time in both DTMF and Pulse dial formats. The VNA 70 Digit Grabber also includes a built-in speaker and allows audio

monitoring in both measurement and display modes. A switch is provided to select LO/HI monitor level or to turn the speaker off when not needed.

The VNA-70A measures just 4" x 7.5" x 1.33" and is shipped complete with a braided cordset with 5-way alligator clips, rechargeable 9-volt battery, ac power adapter, padded carrying case with belt clip, instruction manual and application notes. Ninety-day warranty.

610X850.....VNA-70A
1-5, \$572.00 ea.
6-up, 544.00 ea.

Model TPM-32 DTMF/Dial Pulse Digit Display Unit

- 32-digit alphanumeric display
- DTMF and pulse dial operation
- Battery powered — portable

The TPM-32 is the first digit display unit designed for field applications. It is lightweight, low cost and very easy to use. It accurately displays (with large LCDs) up to 32 alphanumeric DTMF or pulse generated digits dialed through a phone system. In addition to the visual display, the TPM-32 also provides audible monitoring through a miniature speaker and is battery operated for field application.

The TPM-32/MF combines all the features of the standard unit plus has the capability of displaying multi-frequency (FMRI) data. It is an indispensable aid in maintaining and troubleshooting equipment used in Feature Group B and Feature Group D service. Both Models TPM-32 and TPM-32/MF come complete with an attractive carrying case, hook-up leads and operations manual. Ninety-day warranty.



610X700 Standard Model TPM-32.....1-5, \$280.00 ea.; 6-up, \$266.00 ea.
610X710 MFRI Model TPM-32/MF.....1-5, 722.00 ea.; 6-up, 686.00 ea.





Model 76B High-Speed Bit Error Rate Test Set

One Solution for Testing T1, Fractional T1, Sync and Async Networks

- Versatile model for end-to-end, point-to-point and loopback testing
- Troubleshoots and isolates faulty or marginal network equipment
- Available interface modules include DS1/T1/ISDN, RS-232-C, RS-449-B/EIA 530, V.35, MIL-188-114, G.703 plus full and fractional T1
- 12 LEDs monitor the key signals in each interface

International Data Sciences' Model 76B is an all-purpose, hand-held Bit Error Rate Tester (BERT). Use it for testing all T1, fractional T1, sync and async networks running at data rates of 10-10,000,000 bps. It is capable of performing error analysis over a variety of interfaces at data rates of up to 10 Mbps synchronous and 38.4 Kbps asynchronous. Model 76B can perform Bit Error Rate, Block Error Rate and Error-Free Seconds testing, and it can monitor any T1 or fractional T1 link and count bipolar violations, framing, errors, CRC errors and the number of times sync has been lost.

Using a 48-character, two-line LCD display, Model 76B features slide and push-button switches plus plug-in modular interfaces that allow connection to most datacom networks. The display provides test results information and prompts for ease of use. The type of test and the resulting displayed information are determined by the MODE switch position. BERT, BLERT and EFS selections may be used for asynchronous and synchronous testing; the DSX ERR selection may be used for monitoring the T1 link. A unique feature of the 76B is its ability to transmit and receive 1-in-8 and 3-in-24 patterns to stress T1 and fractional T1 networks with a 1's density of 12.5%. These patterns are locked to the ESF and Superframe format and will *not* trigger yellow alarms along the network.

You can operate Model 76B in the four following modes:

Bit Error Rate (BERT) mode is used to perform a bit error rate test utilizing the selected async or sync PATTERN at the selected DATA RATE. In this mode, the display provides the errored bits total (EBIT), the total bits count (TBIT), the bit error rate (BER) and the number of times synchronization has been lost (SYLST).

Error-Free Seconds (EFS) mode provides an error rate based on time in

blocks of 1 second, a method that effectively minimizes degradation of the overall error rate due to burst errors. The EFS measurement can be translated directly into a measurement of the percentage of time that data will be transmitted error-free over the link. This mode also displays the number of errored seconds, the total number of seconds the test has been running, the percentage of error-free seconds and the number of times synchronization has been lost. *This feature is unique to the Model 76B and greatly enhances its testing capabilities.*

Model 76B Specifications

- Tests T1, Fractional T1, Synchronous and Asynchronous Networks
- Synchronous Data Rates to 10 Mbps; synchronous Rates to 38.4 Kbps
- Measures Bit Error Rate, Block Error Rate and Error-Free Seconds
- Counts Bipolar Violations, Framing Errors and CRC Errors
- Tests T1 Unframed, D4 and Extended Superframe Data Links
- Tests Full and Fractional T1 Circuits in Full-Duplex Mode from a Central Site
- Detects Loss of Carrier, Loss of Local and Remote Frame Sync

DSX ERR mode is used for monitoring a digital, bipolar network such as T1 or fractional T1. The DSX ERR selection will operate only when a T1, fractional T1 or other bipolar interface module is plugged into the Model 76B. When the T1 or fractional T1 interface is installed, the display shows the number of unintentional bipolar violations (BPV), the number of framing errors (FERR), the percentage of error-free seconds with respect to the displayed errors and the number of CRC-6 errors (ECRC) if the selected framing is extended Superframe (ESF). In the event of a Loss of Carrier, Yellow or Red Alarm, the alarm condition will be indicated on the display.

Block Error Rate (BLERT) mode is used to perform a block error rate test. In this mode, the unit will count and display errored blocks, transmitted blocks, block error rate and sync lost count.

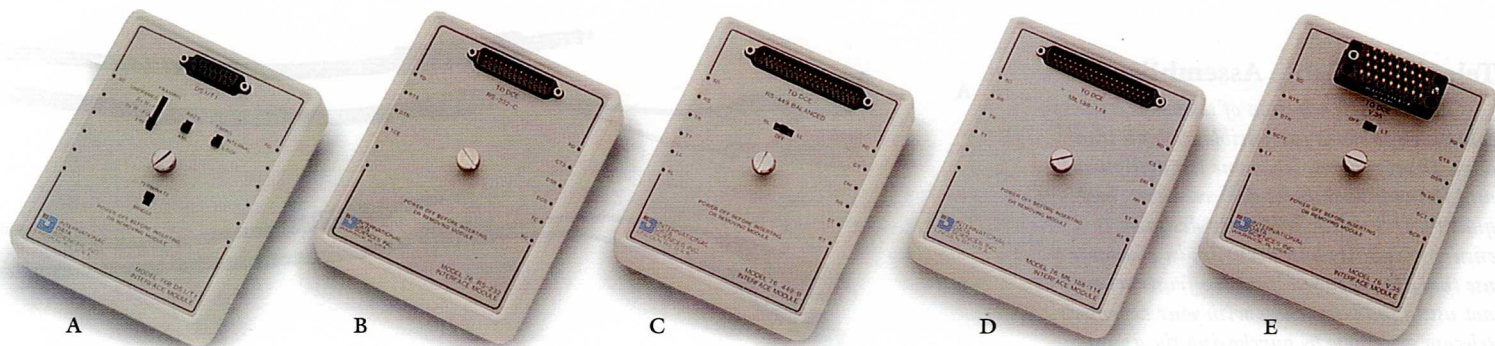
Model 76B operates on 115 V ac power or rechargeable batteries (with optional Model 45 Battery Pack/Charger). It is packaged in a high-impact case with a plastic-molded, scratch-resistant Lexan panel that assures many years of reliable service. The unit measures 8.1" (D) x 6.9" (W) x 2.4" (H), weighs only three pounds and comes with its own portable battery pack, comprehensive operations manual and canvas carrying case. The unit comes with a three-year warranty.

Interface modules for both U.S. and International standard datacom interfaces must be purchased separately to operate the 76B. See descriptions on the following page.

420X076 Model 76B Tester1-2, \$1690.00 ea.; 3-up, \$1589.00 ea.

420X045 Model 45 Optional Battery Pack.....495.00 ea.





A. DS1/T1/ISDN Interface Module

420X712 DS1/T1/ISDN Interface Module\$690.00 ea.

B. RS-232-C Interface Module

420X720 RS-232-C Interface Module\$390.00 ea.

C. MIL 188-114 Interface Module

420X716 MIL 188-114 Interface Module\$390.00 ea.

D. RS-449-B (Balanced) Interface Module*

420X730 RS-449-B (Balanced) Interface Module\$390.00 ea.

E. V.35 Interface Module

420X740 V.35 Interface Module\$390.00 ea.

(Not Pictured) EIA 530 Interface Module

420X760 EIA 530 Interface Module\$390.00 ea.

(Not Pictured) G.703 (64 Kbps) Co-Directional* Module

* "Contra" Version Also Available — Contact Our Sales Department

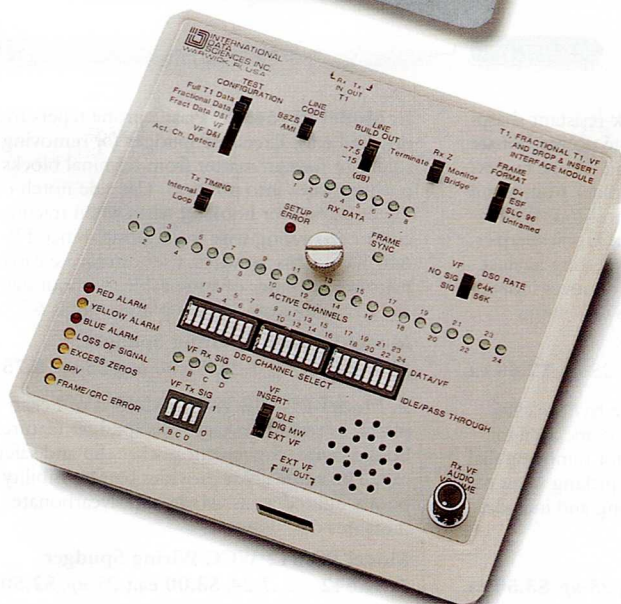
420X750 G.703 (64 Kbps) Interface Module\$790.00 ea.

(Not Pictured) G.703 (8.448 Mbps) Interface Module

420X754 G.703 (8.448 Mbps) Interface Module\$790.00 ea.

Model 76B Interface Cables

420X910	DS1/T1 or T1/Fractional T1 Module to 15D (F), 3'	\$ 50.00 ea.
420X914	DS1/T1 or T1/Fractional T1 Module to 310, 3'	100.00 ea.
420X916	DS1/T1 or T1/Fractional T1 Module to Bantam, 3'	50.00 ea.
420X918	DS1/T1 or T1/Fractional T1 Module to RJ48, 3'	50.00 ea.
420X920	T1/Frct. T1, Data and VF Drop & Insert Mod to Bantam, 6'	50.00 ea.
420X922	T1/Frct. T1, Data and VF Drop & Insert Mod to 310, 6'	50.00 ea.
420X924	X.21 Module to 15D (M/F), 6' Ribbon	50.00 ea.
420X926	RS-232 Module to 25D (M/F), 6' Ribbon	50.00 ea.
420X928	V.35 Module to V.35 (M), 3'	100.00 ea.
420X930	RS-449 or MIL-188-114 Module to 37D (M), 3'	50.00 ea.



NEW!

Full and Fractional T1 Module

Provides the ability to test both full and fractional T1 circuits in full-duplex mode, allowing testing to be performed at a central site. Both contiguous and noncontiguous fractional T1 circuits can be tested at DSO data rates of either 56 or 64 Kbps. Line build-out is also provided. A level meter displays the dB level of the received signal, and all active DSO channels are automatically detected and indicated.

420X735 Full and Fractional T1 Module\$990.00 ea.

Full and Fractional T1 Specifications

- Tests full and fractional T1, contiguous, noncontiguous, all full-duplex
- Select any N out of 24 DSO channels
- Detects and indicates all active DSO channels
- Line build-out
- Unframed, superframed and ESF
- Loop and internal Tx timing
- 56 and 64 Kbps DSO data rates
- B8ZS and AMI line codes
- Level meter measures Rx signal level
- Displays excess zeros, red, yellow, blue and loss-of-carrier audible alarms

Interface Module for 76B

T1, Fractional T1 and VF Drop and Insert Interface Module

This unit plugs into the IDS Model 76B Bit Error Rate Test Set, enabling the 76B to perform tests on full T1 or fractional T1 circuits in a T1 circuit termination or drop and insert mode. Use Bantam jacks to connect to the T1 line. An added feature is the ability to test VF channels on a T1 line in a T1 circuit termination or drop and insert mode. VF Bantam jacks allow an external VF test set to perform extensive tests on VF channels. T1 framing capabilities consist of D4, ESF, SLC-96 or unframed. Other unit features include loop or internal TX timing, AMI or B8ZS line code and 0 dB, -7.5 dB or -15 dB line build out. Both contiguous and noncontiguous fractional T1 circuits can be tested at DSO rates of 56 K or 64 K. The active channel detect has 24 LEDs to display active channels and indicate which channels are not idle. RX signalling is displayed on four LEDs. Alarm and error LEDs display red, yellow, blue, BPV, Frame/CRC error, excess zeros, loss of signal and setup error. Three-year warranty.

420X736 T1 Drop and Insert Module for 76B\$1490.00 ea.



Telephone Cable Assemblies

Our complete selection of telephone/telecom patch cables is compatible with all standard phone systems, telephone test equipment and many interconnect devices. Ultra-high quality, U.S.-made cables are designed to ensure reliability and accuracy in whatever use they are employed. End the frustration of not using the exact cable with your expensive telecom gear now by purchasing the appropriate style for your requirement.

A. PJ-051 Phone Plug (WE 310) to Alligator Clips: PJ-051 brass phone plug connected to two nickel-plated steel alligator clips with a red and a black vinyl boot by two-conductor, twisted-pair cable. Choose 60" or 120" length.

3352-A-60 60" Cable Assembly
630X090.....1-9, \$34.00 ea.; 10-up, \$30.75 ea.

3352-A-120 120" Cable Assembly
630X092.....1-9, \$37.75 ea.; 10-up, \$34.00 ea.

B. Bantam Plug to Alligator Clips: Miniature three-conductor phone plug connected to two nickel-plated steel alligator clips with one red and one black vinyl boot by two-conductor, shielded stranded, copper 26 AWG cable. Choose 36" or 60" length.

5026-36 36" Cable Assembly
630X630.....1-9, \$30.00 ea.; 10-up, \$27.00 ea.

5026-60 60" Cable Assembly
630X632.....1-9, \$32.00 ea.; 10-up, \$29.00 ea.

C. PJ-051 Phone Plug (WE310) Each End: Two PJ-051 brass phone plugs connected by two-conductor, twisted-pair cable. Choose 18", 36" or 60" length.

2524-A-18 18" Cable Assembly
630X078.....1-9, \$35.00 ea.; 10-up, \$31.50 ea.

2524-A-36 36" Cable Assembly
630X080.....1-9, \$36.00 ea.; 10-up, \$32.50 ea.

2524-A-60 60" Cable Assembly
630X082.....1-9, \$37.00 ea.; 10-up, \$33.00 ea.

D. Miniature Phone Plug Each End: Two miniature three-conductor phone plugs connected by two-conductor, shielded, stranded copper 26 AWG cable. Choose 12", 36" or 60" length.

4279-12 12" Cable Assembly
630X360.....1-9, \$25.50 ea.; 10-up, \$23.00 ea.

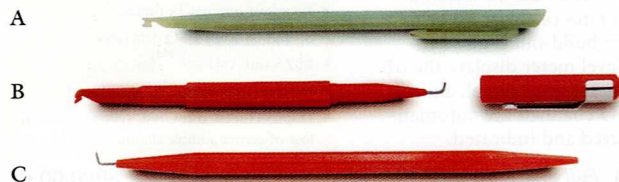
4279-36 36" Cable Assembly
630X362.....1-9, \$27.00 ea.; 10-up, \$24.50 ea.

4279-60 60" Cable Assembly
630X364.....1-9, \$28.50 ea.; 10-up, \$25.75 ea.

E. Miniature Phone Plug to PJ-051 Phone Plug (WE 310): Consists of miniature three-conductor phone plug connected to PJ-051 brass phone plug by two-conductor, shielded, stranded copper 26 AWG cable. Choose from 36" and 60" lengths.

4280-36 36" Cable Assembly
630X370.....1-9, \$60.00 ea.; 10-up, \$54.00 ea.

4280-60 60" Cable Assembly
630X372.....1-9, \$61.00 ea.; 10-up, \$55.00 ea.



Wiring Spudgers

A. Model 630: This is our basic spudger. Molded entirely of delrin plastic, it is used to check for loose or damaged connections or to spread apart wires for direct access. The 630 is 5.5" long with molded-on pocket clip.

Model 630 Spudger
301X630.....1-24, \$2.00 ea.; 25-up, \$1.75 ea.

B. Model 44600-000: Our most popular tool, Probe Pic combines the functions of a basic spudger for checking wires with a release tool for pulling wires from a bunch or picking a single wire off a flat surface. Kynar insulation protects against shorting adjacent components. Removable safety cap protects user's clothing. This tool is 5.25" long.

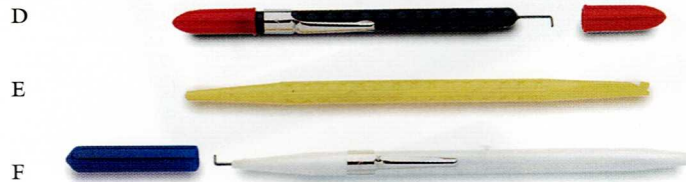
Model 44600-000 Probe Pic
350X845.....1-24, \$4.90 ea.; 25-up, \$4.35 ea.

C. Model PP-4443-SW: Break-resistant sharp wire spudger is molded of orange polycarbonate for high visibility in poor lighting. Probe tapers to flat notched end to remove solder from terminal blocks and push wires into position. Wire is stiff due to high tensile strength. Hook sharpened to .010 end picks up wires resting against flat surface or separates and/or removes individual wires from maze. Spudger is 6.7" long.

Model PP-4443-SW Spudger
303X683.....1-24, \$3.00 ea.; 25-up, \$2.50 ea.

D. Model SC-200: A long-time favorite, this tool has been in use for over 25 years. Straight and hooked wire ends are used for removing dial finger wheels, tracing wires and picking wires off flat surface. The tool is 5.75" long and includes end caps and pocket clip.

Model SC-200 Release Tool
303X200.....1-24, \$4.00 ea.; 25-up, \$3.50 ea.



E. Model PP-640 Y: Plastic probe tapers to flat notched end. Excellent spudger for removing solder or foreign matter from terminal blocks or pushing wires into position. Use side notch on flattened end for hooking wires when tracing circuit or separating wire from group. Since PP-640 Y contains no wires, user can locate cable pairs in the center of large cables without damage to conductors. Yellow plastic tool is 6.7" long.

Model PP-640-Y Wiring Spudger
303X640.....1-24, \$1.00 ea.; 25-up, \$.75 ea.

F. Model PP-642 WCC: Molded of Lexan plastic to resist breakage, this spudger features a hooked wire, convenient pocket clip and safety cap. The white color provides better visibility in poorly lighted areas. Made of polycarbonate, it measures 6.7" long.

Model PP-642-WCC Wiring Spudger
303X642.....1-24, \$3.00 ea.; 25-up, \$2.50 ea.



A. Modular Adapters

Programmable Adapters — No Tools Required

Finally, a simple way to program a modular adapter — without using insertion tools. Each auxiliary connector has short wire leads terminated by insulated receptacles which finger push into the RS232 mating pins. The programming may be altered or converted at any time by simply repositioning the wires which mate with either a male (M) or female (F) fully populated DB25 connector. Perfect for temporary connections for testing or field installations.

Stock No.	Description	Prices	
		1-9	10-up
668X620	DB25 (F) to RJ12/RJ45	\$13.00	\$11.00
668X622	DB25 (M) to RJ12/RJ45	13.00	11.00

B. Modular Cables and Extension Couplers

Complete selection of six-conductor (RJ11), eight-conductor (RJ45) and six-conductor offset (DEC, MMJ-Type) patch/extension cables and extension couplers. End the frustration of not having the correct cable type or length. Extension couplers are used to connect two male-ended modular cables to extend cord length. Cables are all straight-wired to ensure compatibility.

Stock No.	Description	Prices	
		1-9	10-up
668X578	RJ45 Cable (2')	\$3.00	\$2.55
668X580	RJ45 Cable (14')	5.75	5.00
668X582	RJ45 Cable (25')	8.75	8.00
668X600	RJ11 Cable (14')	4.75	4.00
668X602	RJ11 Cable (25')	6.75	5.75
668X300	RJ11 Ext. Coupler	3.00	2.55
668X302	MMJ (DEC) Coupler	3.00	2.55
668X304	RJ45 Ext. Coupler	3.50	3.00



Quick Connect Adapters

Including New Category 5 Adapters

Four-pair adapters eliminate connecting blocks. They transform AT&T 110, 66B and 66M plus Northern Telecom BIX blocks into modular patch panels. Dependable enough for permanent high-speed data connections, tough contacts make reliable connections. Isolate trouble and test new cable installations. Quick Connect Adapters permit quick test equipment room connections and are excellent for temporary or permanent home run installations of communications terminals. Other uses include half-taps during system cutovers plus moves, adds or changes. No tools or wiring costs are required. For station moves, unplug and reconnect to new cable termination. No need to change cross connect or wire terminations. When moving to a new address, unplug system and adapters. Then reconnect in new location.

Choose from 10 models, each with a durable, fiberglass, reinforced plastic housing. They are intended for communications circuits operating at 100 MA or less and a maximum of 56.5 V dc, ringing voltage not to exceed 150 V rms. A-H adapters meet all Level IV (16-Mbit Ethernet) requirements. I and J 110 Cat 5 (100-Mbit Ethernet) adapters are certified Cat 5 and color coded red for 568A and black for 568B. They meet or exceed TSB40 and TSB40-A requirements for Cat 5 plus Level III and IV performance.

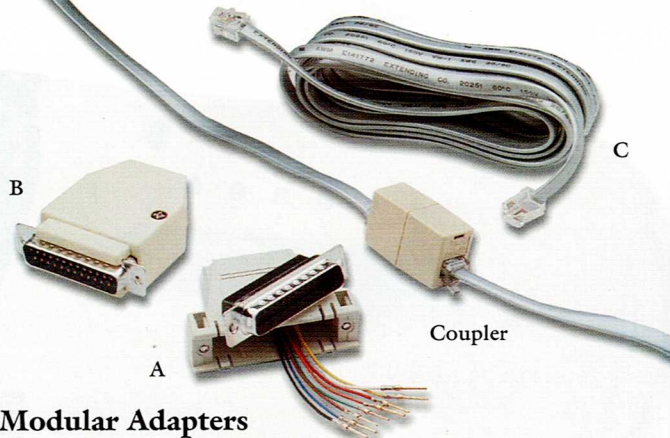
A. ITC-3002B Four-Pair 110 Block Adapter (568B)
690X225 ITC-3002B 110.....1-11, \$15.00 ea.; 12-up, \$12.75 ea.

B. ITC-3002B-A Four-Pair 110 Block Adapter (568A):
690X227 ITC-3002B-A 110.....1-11, \$15.00 ea.; 12-up, \$12.75 ea.

C. ITC-3002B-3 Three-Pair 110 Block Adapter (568B)
690X215 ITC-3002B-3 110.....1-11, \$13.75 ea.; 12-up, \$11.75 ea.

D. ITC-3002C Four-Pair Universal 66 Block Adapter (568B):
690X230 ITC-3002C 66.....1-11, \$21.50 ea.; 12-up, \$18.50 ea.

E. ITC-3008 Three-Pair BIX Block Adapter (USOC)
690X250 ITC-3008 BIX.....1-11, \$13.75 ea.; 12-up, \$11.75 ea.



C. Modular Adapters

For Permanent Installations

Eliminate the annoyance of screwing and unscrewing bulky and expensive data cables whenever you want to move a peripheral. Simply replace with the appropriate Modular Adapter listed below. Each unit is programmable to your needs by simply inserting the flying leads (with the TDT insertion/extraction tool) into the appropriate positions and snapping the connector into place. Because of their one-piece construction, there are no loose hardware or difficult procedures to follow. Perfect for field installations.

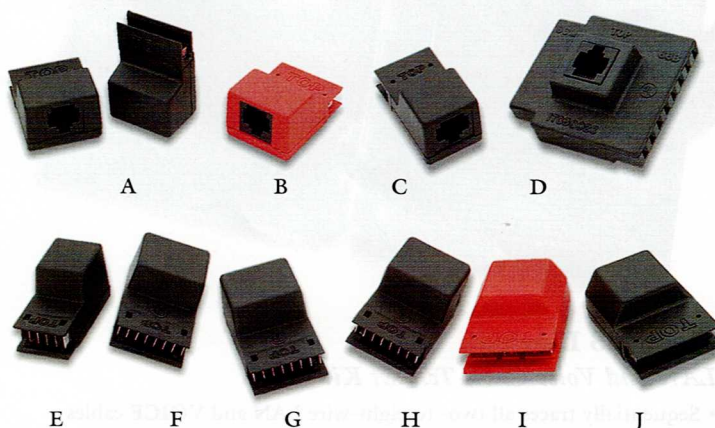
Stock No.	Description	Prices	
		1-9	10-up
668X506	DB25 (F) to RJ11	\$8.75	\$7.50
668X508	DB25 (M) to RJ11	8.75	7.50
668X512	DB25 (F) to MMJ (DEC)	9.50	8.00
668X514	DB25 (M) to MMJ (DEC)	9.50	8.00
668X500	DB25 (F) to RJ45	9.50	8.00
668X502	DB25 (M) to RJ45	9.50	8.00

LT-3 Telephone Line Tester

LT-3 Telephone Line Tester is an inexpensive tool to troubleshoot common problem conditions quickly. Tests for common line trouble to help prevent expensive needless or misdirected service calls. LT-3 simply plugs into your standard telephone line jack. The indicator light illuminates green for OK line function, red for reverse polarity and amber for ac voltage presence. Clips into shirt pockets so it is as available as your ball-point pen.

LT-3 Telephone Line Tester

690X800 LT-3.....1-24, \$6.00 ea.; 25-99, \$5.00 ea.; 100-up, \$4.50 ea.



F. ITC-3009 Four-Pair BIX Block Adapter (568B)
690X255 ITC-3009 BIX.....1-11, \$15.00 ea.; 12-up, \$12.75 ea.

G. ITC-3009A Four-Pair BIX Block Adapter (568A):
690X260 ITC-3009A BIX.....1-11, \$15.00 ea.; 12-up, \$12.75 ea.

H. ITC-3009U Four-Pair BIX Block Adapter (USOCRJ36):
690X290 ITC-3009U BIX.....1-11, \$15.00 ea.; 12-up, \$12.75 ea.

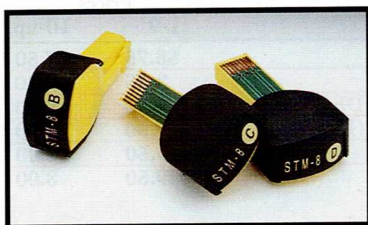
I. ITC-3502A Four-Pair Cat 5 110 Block Adapter (568A):
690X400 ITC-3502A 110.....1-11, \$27.50 ea.; 12-up, \$23.50 ea.

J. ITC-3502B Four-Pair Cat 5 110 Block Adapter (568B):
690X405 ITC-3502B 110.....1-11, \$27.50 ea.; 12-up, \$23.50 ea.





THE
SIEMON COMPANY



STM-8

Hand-Held Cable Tester

Economical and versatile, the STM-8 hand-held tester is capable of testing up to 900 meters (2950 feet) of one-, two-, three- or four-pair cable for opens, shorts, reversals, miswires and cross-twists. Excellent for use in the field, its rugged ergonomic construction and easy-to-read LCD allow one technician to test and identify up to four different cables quickly at one time. The STM-8 can generate tone on any pin. In TALK BAT mode, it enables communications by applying voltage to center two pins.

Use the STM-8 to test T568A, T568B, USOC, 10BASE-T, Token™ Ring and TP-PMD active pair configurations. All indications are presented on the master's large LCD. For further ease, each LCD segment represents a modular connector pin location. In FIND mode the STM-8 will identify which wires are twisted together and will display the configuration on the LCD. To protect the unit from accidental damage or down time in the field, the display indicates presence of line voltage. This unit also features a low-battery indication and an automatic shut-off for battery preservation.

The STM-8 consists of a hand-held master unit and one remote unit labeled A. It comes packaged in a padded nylon carrying case with in-line coupler, modular cord, handy wiring reference guide and 9-volt battery. Three additional remotes may be purchased for multiple-channel testing. Each of the four remotes can be individually identified by the master unit. The modular cord and remote are equipped with Sieman's patented Universal plug which fits into any standard six- or eight-position modular jack. The STM-8 is a very compact 5.5" x 2.8" x 1.8". One-year warranty. Additional remote also may be ordered — see STM8-R3 below.

620X345 STM-8 Cable Tester 1-5, \$198.00 ea.; 6-up, \$188.00 ea.

STM8-R3 Remote Kit

Additional remotes (B, C and D) are available separately or as a kit. Designed for multiple-cable testing, they conveniently fit into six- or eight-position jacks and require no power.

620X350 STM-8-R3 Remote Kit \$39.00 ea.



Model 83 Lineman

LAN and Voice Cable Test Set Kit

- Sequentially traces all two- to eight-wire LAN and VOICE cables
- Detects opens, shorts, pair reversals and cross-wiring
- Tone traces up to three lines simultaneously
- Puts tracer tones on HOT dial-tone lines
- Traces telco lines connected to 48-V battery

IDS Model 83 Lineman is a kit full of essential accessories for testing and verifying all LAN and VOICE cabling systems. The battery-powered unit transmits audible tracer tones sequentially on each line of two-, four-, six- and eight-wire LAN and voice network cables. Installers can use this hand-held test set during and after installation. Afterward each cable can be verified quickly for accuracy, minimizing installation costs and repair time. Immediately verify 10BASE-T, Token Ring and USOC cable pairs including Tip and Ring assignments.

Tracer tones are sent from the wall jack back to the wiring closet. They are received by a remote Lineman or industry standard inductive amplifier (i.e., PEI 200EP) at the other end. Tracer tones may be looped back to the



INTERNATIONAL
DATA
SCIENCES, INC

same unit for single-ended testing. Observe LED lighting sequence to identify opened, shorted, pair reversed and crossed wires. Tones locate hidden cables or specific wires in a bundle with a standard inductive tracer tone detector or another Model 83. Trace telco lines connected to a 48-V battery.

The Lineman acts as an RJ45 breakout box for re-wiring lines and cross patching dissimilar wiring schemes. Reassign a line to a different pin to check LED and integrity of connection by inserting mini jumper wires. Tracer tones locate HOT dial-tone lines with the help of inductive amplifier or line aid. This unique IDS feature is a real time saver. Sends up to three tracer tones (High/Low, High and Low) simultaneously, overriding dial tones, talk battery voltages and busy signals on any line. (Two units are required to send three different tones for simultaneous tracing.) Connect the Lineman to external electrical or building ground to test all eight wires.

Housed in a durable, high-impact plastic case, Model 83 has built-in compartments for four supplied mini stacking jumper wires, three alligator clip cords and four AA batteries. Battery life exceeds four months of continuous usage. The 1-pound unit is 5" x 4" x 1.75".

Test Kit-83 includes 83 Lineman plus accessories for end-to-end and loopback testing. You get 2-foot RJ45 to RJ11 patch cable, remote loopback plug, RJ45 'Y' cable, 2-foot RJ45 patch cable, 110-type block adapter, 66-type block adapter and deluxe carrying case with separate compartments for test set and accessories. Token Ring adapter is optional. One-year warranty.

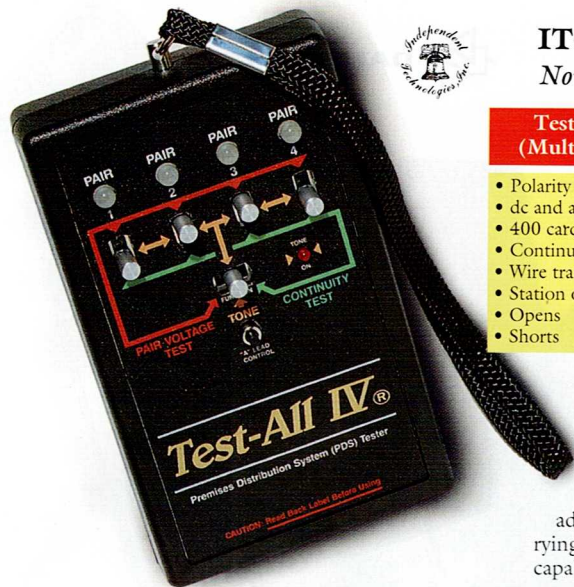
420X082 Test Kit-83 1-5, \$275.00 ea.; 6-up, \$258.00 ea.
420X083 Model 83 Test Set Only 1-5, 195.00 ea.; 6-up, 182.00 ea.
420X085 Adapter Kit Only (No. 83) .. 1-5, 99.00 ea.; 6-up, 89.00 ea.
668X548 Token Ring Adapter Only 25.00 ea.





ITC-3002 Test-All IV Four Pair Cable Tester

Now Features New Design and Heavy-Duty Construction



Test-All IV Tests (Multiple Pairs) for:

- Polarity reversals
- dc and ac voltages
- 400 card operation (1A2)
- Continuity
- Wire transpositions
- Station operating conditions
- Opens
- Shorts

The Test-All IV is specifically designed for testing new cable prior to installation of communications equipment without an additional power supply. It performs a high quality job of testing cable in only a quarter of the time by testing *four pairs simultaneously*. It also locates trouble that other test sets cannot find, such as transpositions and reversals. Of course, it works equally well with single, two-pair and three-pair cables also.

This unit was manufactured specifically to work with AT&T Information Systems' four pair wiring plan but works equally well with all other wiring configurations and phone systems from 1A2 key systems to local area networks (LANs) to the newest in electronic PBX and Key systems. It is capable of troubleshooting multiple pair communication systems, monitoring the output of common equipment and even testing for proper station voltages.

Model ITC-3002 tests for continuity, detects opens, shorts, polarity reversals and wire transpositions. A built-in tone source has even been included to help the user to locate the source of trouble once it has been identified.

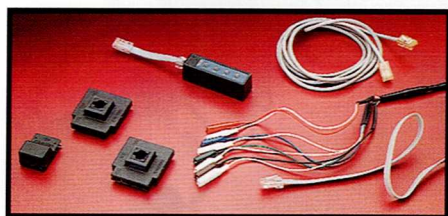
The Test-All IV measures a pocket-sized 4.75" x 3" x 1" and comes complete with an eight-conductor modular cord, 66-type Universal block adapters (two each), a 110 block adapter, a modular LED shorting plug, an eight-conductor modular alligator clip cord, a padded carrying case with belt loop and a comprehensive user's guide that clearly outlines each test Test-All IV is capable of performing. *The ITC-3002 has been assigned AT&T Comcode #405-490-764.*

690X200 ITC-3002 Test-All IV.....1-5, \$259.00 ea.; 6-up, \$245.00 ea.

Replacement Accessories

Need additional or replacement test accessories? Each of the following Test-All IV accessories was originally supplied with the ITC-3002 tester but may be purchased separately as well.

690X225 ITC-3002B Repl. "110" Block Adapter.....\$15.00 ea.
690X230 ITC-3002C Repl. "66" Block Adapter.....21.50 ea.
690X234 ITC-3002E Repl. Modular LED Shorting Plug.....48.00 ea.
690X236 ITC-3002F Repl. 8-Conductor Alligator Clip Cord.....27.50 ea.
690X255 ITC-3009 BIX Adapter (4-pair).....15.00 ea.



Model DXB900

DB9 Sequential Cable Tester

- Test cables terminated by nine-pin D-sub connectors
- Scan all lines automatically or sequence one at a time

Model DXB900 is designed specifically for testing data and video cables terminated by nine-pin D-sub connectors. Its 20 sequencing LEDs instantly identify opens, shorts, crosses and jumpers that are common errors in video and custom data cables. Simply depressing the power button causes the unit to scan all lines automatically. Or the user may choose to sequence lines one at a time. This is a real advantage when determining how a cable is wired.

The DXB900 is made of heavy-gauge steel, has dual DB9 male and female connectors and auto shut-off to preserve battery life. It comes with a 9-volt alkaline battery installed for immediate use. The 1-pound DB9 Sequential Cable Tester measures 7" x 3" x 1". A variety of adapters is available for testing cabling with high-density 15 D-sub, shielded RJ45 connectors and 10-position modular plugs. Each set includes two adapters and a faceplate overlay which makes cable analysis simple. One-year warranty.

668X200 DXB900 D-Subminiature Nine-Position Sequential Tester.....1-9, \$179.00 ea.; 10-up, \$162.00 ea.
668X210 DXB900HD15F VGA Adapters (2/set).....1-9, 25.00 ea.; 10-up, 22.50 ea.
668X215 DXB900RJ45 RJ45 Shielded Adapters (2/set).....1-9, 25.00 ea.; 10-up, 22.50 ea.
668X220 DXB900R10MOD 10-Pin Modular Adapters (2/set).....1-9, 25.00 ea.; 10-up, 22.50 ea.



DXB66 Remote Cable Tester

UTP, FTP and Coaxial Professional Test Set

- Battery-powered set tests RJ45 plus shield
- Convenient size with exclusive slide lock mechanism
- Dual colored LEDs identify shorted, open or reversed pairs

L-com's DXB66 Remote Cable Tester provides accurate testing of premise cabling and patch cords used in local area networks. The unit verifies pairing following the EIA/TIA568 standard. Tests shield continuity which is a requirement in European building installations and areas where noise is prevalent. BNC equipped set also tests coaxial cabling used in broadband networks such as Ethernet 10BASE-2.

Use this set with Ethernet, TP-PMD, Token Ring and EIA/TIA 568 LAN cabling and premise wiring. Sequencing LEDs verify continuity of four-pair UTP/FTP cabling following EIA/TIA568 A or B pair designations. Ethernet 10BASE-T, Token Ring and TP-PMD are accounted for in EIA568 code. Tests for the presence of shield in Foil Twisted-Pair (FTP) or Token Ring Shielded Twisted-Pair (STP) cabling. BNC coax test checks Ethernet 10BASE-2 busses and patch cords. Dual colored LEDs identify shorted, open or reversed pairs. Internal circuitry is fully protected against live cable damage.

An exclusive slide lock mechanism provides effortless patch cord and premise cable testing. With master and remote units joined, patch cord testing is convenient and easy for more productive bench use. Separate master and remote sections to verify premise cabling and coaxial busses.

All instructions are listed on the faceplate of this easy-to-operate tester. Includes two screened patch cords, one 9-volt alkaline battery, belt-mountable soft leatherette case and instruction booklet. The 6-ounce set (master and remote connected together) is 6" x 2.3" x 1". One-year warranty.

668X160 DXB66 Remote Cable Tester.....1-5, \$149.00 ea.; 6-up, \$135.00 ea.



CT-50 Cable-Tracker

Revolutionary 50-Pin Cable Analyzer/Tester

- Tests any 50-pin Amphenol or 57-series AMP interconnect cable
- LCD monitors all 100 termination points and their configuration
- Simple, reliable cable testing method is a real time saver

Seldom does a piece of test equipment deserve the description revolutionary, but Datatran's innovative CT-50 Cable-Tracker is unlike anything you've ever seen before. This hand-held 50-pin cable analyzer/tester can test any 50-pin Amphenol or 57-series AMP interconnect cable. With optional adapters, it can test other cables consisting of 50 or fewer conductors as well. No other product has this capability.

Millions of 25-pair, 50-conductor telephone cable installations are in the field today. Most new, large PBX systems are designed to use 50-pin Amphenol-type modular connectors. Before the Cable-Tracker, the only way to test these wiring configurations was to use a trial-and-error method involving expensive and complex test equipment. This was very inefficient and extremely time consuming. Now cables can be tested in a matter of seconds, even by inexperienced personnel, by employing the use of Datatran's CT-50.

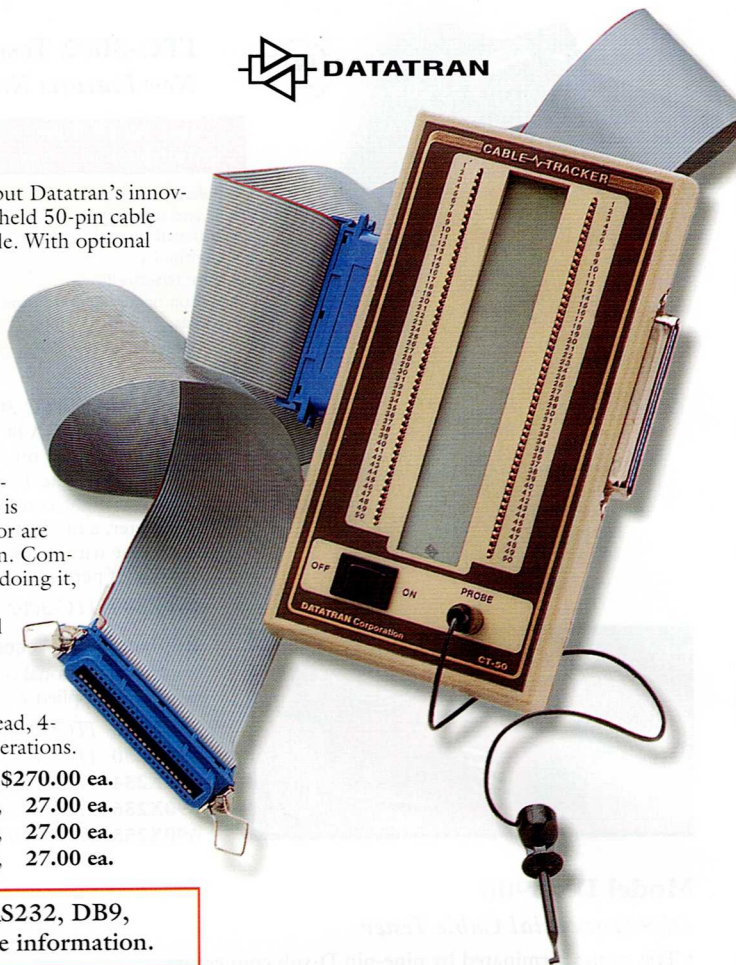
The Cable-Tracker's design utilizes an LCD for easy monitoring of all 100 termination points and their configuration. By manually injecting a test signal which is generated within the CT-50, the wiring scheme and pin number of each conductor are immediately and clearly displayed on the LCD, leaving nothing to the imagination. Compare this simple and reliable method of cable testing to the way you are presently doing it, and you'll agree that the Cable-Tracker is a real time saver.

Optional accessories will maximize the CT-50's performance. Especially useful is the CTA-50 Cable Test Adapter that allows a cable to be tested from a single end by routing the test signal back through a pre-determined pin on the Cable-Tracker. This greatly simplifies the task of testing installed cable.

Your Cable-Tracker comes complete and ready to use. Includes 18-inch clip lead, 4-foot extension cable, deluxe padded carrying case and comprehensive guide to operations.

400X150	CT-50 Cable-Tracker	1-2,	\$299.00 ea.;	3-up,	\$270.00 ea.
400X052	CTA-50 Cable Test Adapter.....	1-11,	30.00 ea.;	12-up,	27.00 ea.
400X110	GM-50-F Female/Female	1-11,	30.00 ea.;	12-up,	27.00 ea.
400X115	GM-50-M Male/Male.....	1-11,	30.00 ea.;	12-up,	27.00 ea.

Many special-purpose adapters are also available including: RS232, DB9, RS449 and IEEE-488. Call the SPC Sales Department for more information.



SLT3™ Single-Line Tester

Identifies Voice and Data Problems

- Three-in-one design with built-in modular jacks
- Verifies continuity and sequence
- Continuously sequencing LED diagnostic readout
- New auto-off feature conserves battery life when not in use

The MOD-TAP SLT3™ Single-Line Tester provides instant identification of the most common voice and data problems including shorts, opens, reversals and miswires. This hand-held tester is ideal for anyone who designs, installs or tests cabling systems.

Incorporating an innovative three-in-one design, the SLT3 features built-in modular jacks for testing USOC, 568A and 568B cabling systems. This eliminates the need to attach separate converters or adapters. The SLT3 accurately verifies the continuity and sequence of one-, two-, three- and four-pair voice and data channels. A continuously sequencing LED display alerts you to cabling problems in the system. The diagnostic readout immediately detects shorts, opens, reversals and miswires at a glance.

Master and remote units separate for end-to-end testing of installed cabling. Simply snap and lock them together when not in use for easy carrying and storage. This also activates the auto-off feature that extends battery life. Jacks are protected. Designed to fit neatly into a toolbox or pocket, the SLT3 has a convenient ring feature for attaching it to a belt or frame.

An optional Accessory Kit contains two six-wire line cords, two eight-wire line cords and four frame adapters (110-USOC, 110-568B, KATT-568B and KATT-568A). Use these adapters to test from punch-down block to wall plate in one simple operation. An optional durable nylon carrying case also is available separately.

The ergonomically designed SLT3 is lightweight, rugged and impact resistant. This attractive green two-unit test set includes a 9-volt alkaline battery. Each 5-ounce section measures 5.75" x 2.4" x 1.5". One-year warranty.

712X300	33-100 SLT3 Tester Only.....	1-5,	\$120.00 ea.;	6-up,	\$110.00 ea.
712X311	33-B0010 SLT3 Accessory Kit.....				99.00 ea.
712X322	33-100-P SLT3 Carrying Case.....				17.00 ea.

MOD-TAP



PC Cable-Check 1570

Deluxe Cable Interface Tester

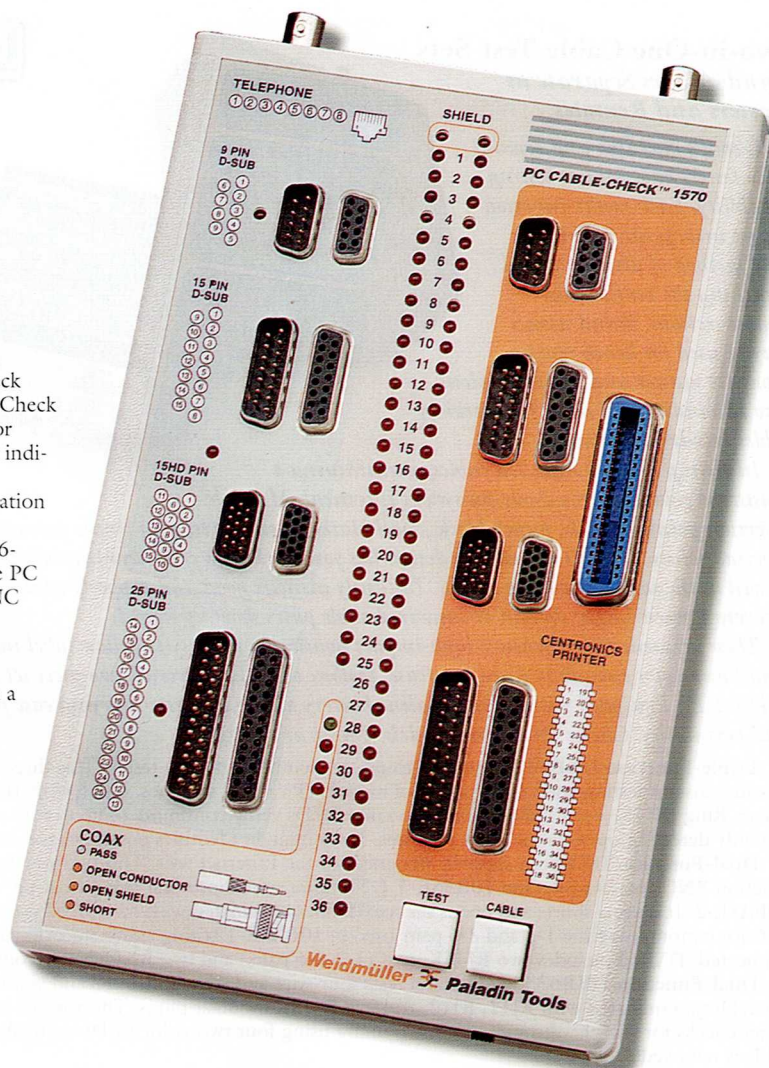
- D-sub, nine-pin
- D-sub, 15-pin
- D-sub, 25-pin
- Centronics, 36-pin
- Modular plug, RJ11 and RJ45
- Coax, RG58, RG59 and RG62

This instrument is really several testers in one with its ability to check many different types of cables in different applications. The PC Cable-Check 1570 by h is the first instrument that tests standard computer cables for open, shorted and cross-connected wires. These checks provide a clear indication of continuity and wiring configuration.

As an additional helpful feature, PC Cable-Check tests any combination of D-Sub nine-pin (male or female), D-Sub 15-pin including HD and male/female, D-Sub 25 male and female configurations, Centronics 36-pin printer and RJ11 and RJ45 telephone plugs. For coaxial needs, the PC Cable-Check 1570 is capable of checking RG58, RG59 and RG62 BNC connections. On these type systems, network cables can be tested for connections with pass or fail diagnosis clearly shown on LED readout. This handy unit also checks shield continuity.

Ready to use as soon as it arrives, the lightweight 1570 comes with a 9-volt battery. It weighs just 2.25 pounds and measures 9.5" x 5.5" x 1.5". One-year warranty.

1570 PC Cable-Check
170X0831-5, \$149.00 ea.; 6-up, \$135.00 ea.



Weidmüller

1575 MAC-Cable-Check™

Cable Continuity and Wiring Configuration Tester

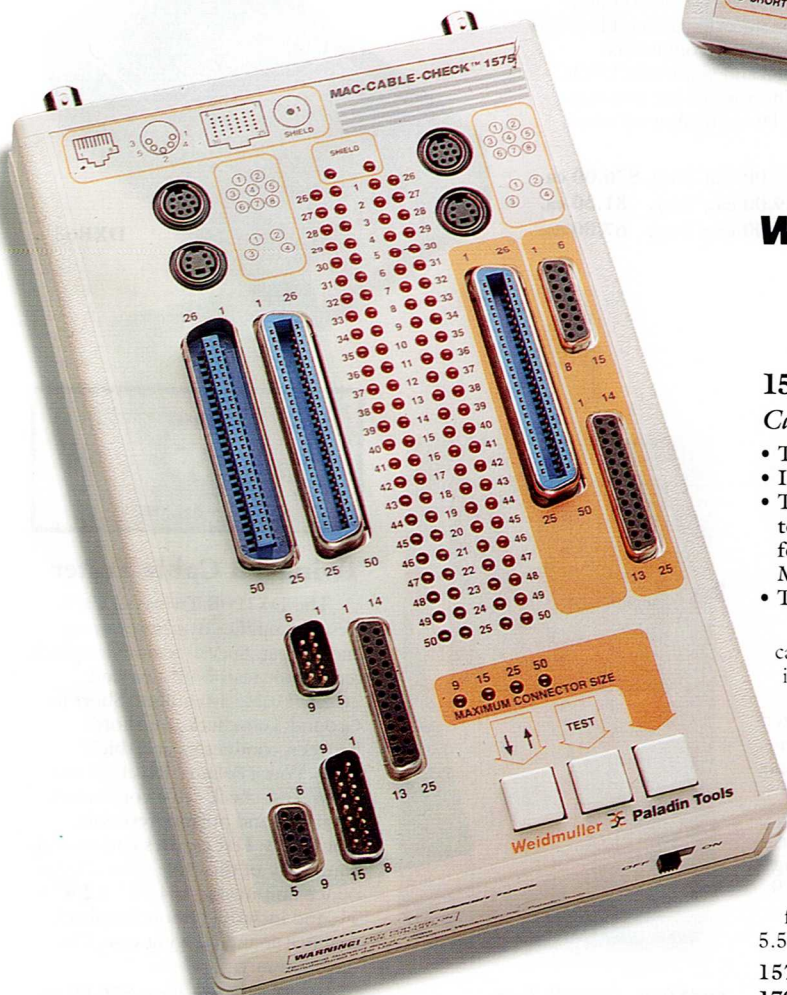
- Tests continuity of Macintosh® and Apple™ cables
- Identifies open, shorted and cross-connected wires
- Tests combinations of coax RG 58, 59, 62 BNC; RJ45 and RJ11 telephone cables; D-sub 9 pin (male/female); D-sub 15 pin (male/female); D-sub 25 pin (female); Centronics 50 pin (male/female); Mini din 4/8 (male/female); Din 5 (male)
- Tests shield continuity

MAC-Cable-Check™ is the first instrument that tests Apple™ Macintosh® cables for open, shorted and cross-connected wires. This dual-purpose instrument provides a clear indication of continuity and wiring configuration. Use Model 1575 from Weidmüller to test any combination of coax RG58, BNC, RJ11/45 telephone plugs, Centronics 50, DB 9, 15 and 25. In addition, four- and eight-pin Mini Din plus five-pin Din are included with the HDI 30 Powerbook SCSI connection.

A unique feature allows the test sequence to be reversed at any time to recap previous pin configurations. Instructions include the most common wiring configurations found with Apple™ Macintosh® systems. This handy unit also checks field continuity.

The lightweight 1575 includes a 9-volt battery installed and ready for use. MAC-Cable-Check weighs just 2.25 ounces and measures 9.5" x 5.5" x 1.5". One-year warranty.

1575 MAC-Cable-Check
170X1451-5, \$199.00 ea.; 6-up, \$180.00 ea.



Two-in-One Cable Test Sets

Stand-Alones Separate as Masters and Remotes

L-com's modular and coaxial cable testers have remote testing capability. Each multi-function test set incorporates a unique slide method of attaching and detaching the master and remote sections. Stand-alones may be used for bench testing. Separate master and remote sections into two individual units for checking cables in wiring systems.

In testing already installed cables, maintaining a consistent polarity throughout the system is critical. Multiple insertion points (panels, punch blocks, wall plates, patch cords, etc.) create potential polarity reversal points. L-com's two-in-one design lets you check each cable segment before installation as well as the complete wiring system. Instantly identify good and properly wired cables just by observing green LEDs; shorted or miswired cable pairs show up in red.

These versatile testers feature high-impact housings with easy-to-follow label instructions. Small and light enough to fit in briefcase, toolbox or pocket. Overall two-piece set size is 4.6" x 2.4" x 1.1". Equipped with 9-volt alkaline battery and leatherette carrying case for protection and portability. Choose from three models. One-year warranty.

Triple-Function DXB64A is an easy-to-use sequential scan cable tester. This three-way test set provides instant testing and identification of most UTP cabling schemes. Use it with 10BASE-T, Token Ring (RJ45) and EIA568. Four two-color LEDs verify continuity of up to four pairs while instantly detecting opens, shorts and miswires. Blinking light identifies power on and low battery.

Dual-Function DXB65 is specially designed for the Ethernet user. This two-way test set is a full-function BNC coaxial tester and 10BASE-T UTP tester rolled into one. Also use it for ThinNet and 10BASE-2. It detects shorts and opens on coaxial lines terminated with male BNC connectors and tests for continuity of the 1-2 and 3-6 pairs used in 10BASE-T wiring. Auto shut-off when cable is disconnected. DXB65 includes two RJ45K jacks (1-2-3-6 pairs) and two BNC female connectors.

Dual-Function DXB63 identifies and tests four-wire and six-wire USOC and eight-wire USOC flat cabling terminated with RJ11, RJ12, RJ45 or RJ45K modular plugs. This easy-to-use two-way tester checks for straight-through or cross-pinning using four two-color LEDs. Auto shut-off when cable is removed.

668X093	DXB64A Triple-Function Test Set	1-5,	\$84.00 ea.;	6-up,	\$76.00 ea.
668X095	DXB65 Dual-Function Test Set	1-5,	89.00 ea.;	6-up,	81.00 ea.
668X091	DXB63 Dual-Function Test Set	1-5,	74.00 ea.;	6-up,	67.00 ea.



DXB64A



DXB65



DXB63

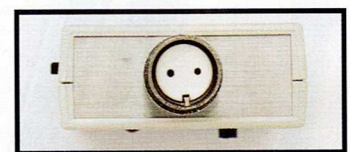


Modular Cable Checkers

Test Any 2-, 4-, 6- or 8-Wire RJ Type Telco or Data Cable

Instantly evaluate the integrity of any RJ11, RJ45 and DEC MMJ equipped modular (telco or data) cable/connectors with L-com pocket-sized testers. Simply plug in both cable ends and observe two color LEDs to identify both continuity and open conditions quickly. Simultaneously, LED color also determines whether cable is properly wired for data use with straight-through pinning (lights red) or voice communication with crossed pinning (lights green). Choose from three models: DX45 for testing RJ45 modular connectors, DX50 for RJ11 modular connectors and DX50DEC for testing DEC MMJ offset modular connectors. Each model is powered by a single 9-V battery (supplied) and measures only 2.4" x 3.75" x 1.1".

668X045	DX-45 (RJ45-Type)	1-5,	\$44.00 ea.;	6-up,	\$40.00 ea.
668X050	DX-50 (RJ11-Type)	1-5,	39.00 ea.;	6-up,	36.00 ea.
668X055	DX-50-DEC (DEC MMJ-Type)	1-5,	44.00 ea.;	6-up,	40.00 ea.



Twinaxial Cable Tester

The DX100B Twinaxial Cable Tester simplifies troubleshooting and testing. Special remote loopback terminator tests both new and installed cable assemblies. Short to Ground Test checks for shorts between conductors and shield. Cross Wire (Polarity Reversal) and Short Test check cable conductors for shorts and polarity reversals. Continuity Test ensures end-to-end continuity of the cable. The .25-ounce unit measures 4.75" x 2.4" x 1", and includes remote loopback terminator and carrying case. One-year warranty.

668X070	DX100B Tester	1-5,	\$84.00 ea.;	6-up,	\$76.00 ea.
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CableMaster 1000™

Multi-Purpose, Cost-Effective Test Set

- Fiber optic testing and Ethernet testing
- Full-definition breakout box and cable monitor
- Cable scanning, comparison and analysis
- Eight-, nine-, 15- and 25-conductor cables
- Fiber optic, AUI, RJ45 cable testing

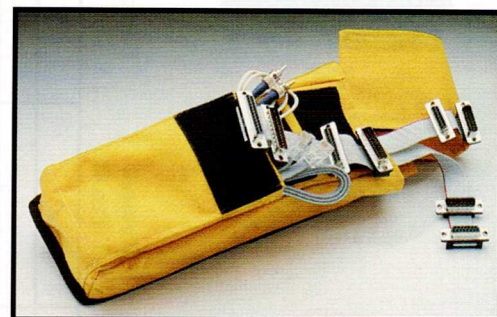
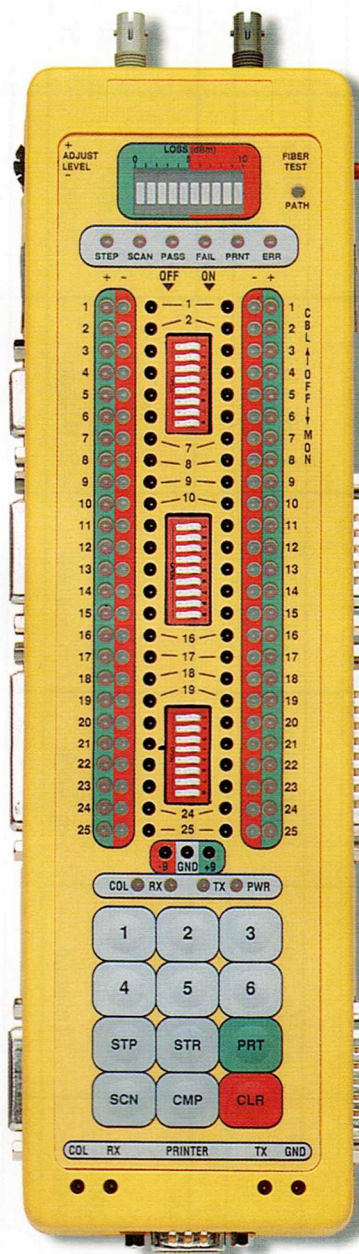
E-COMMS' CableMaster 1000™ is a versatile tester that now also offers generous savings. It provides cable analysis, scanning and comparison for multiple cable types. Use it with more types of cables and connectors than any other test set. It is compatible with nine-, 15- and 25-pin DB connectors on communications cables; eight-pin RJ45 connectors on UTP network cables; Ethernet AUI connectors; and ST connectors on fiber cable. Automatically or manually scan and compare sample or stored cable parameters against cables under test. Industry-standard cables such as PC straight-through, null modem and PC printer cables are stored for instant comparison. Users can store up to three of their own cable parameters for instant comparison to suspect or unknown cables.

Multiple functions are provided in a small, compact and cost-effective package with quick-configure keyboard and DB9 printer port. Use it for ST fiber testing plus full-definition breakout and cable analysis. Now you can carry just one test set in the field where six separate units used to be needed. Equipping your service engineers with CableMaster 1000 reduces your equipment expenditures and makes the operation more efficient and profitable.

Dual ST fiber optic connectors combined with an LED bar graph power level display let you look at the power level capability possible on the cable under test. Set the base level when comparison testing unknown cables against known good cable.

CableMaster 1000 is a multiway cable monitor and full-definition breakout box that provides full definition of all signal lines at a glance. By utilizing red and green LEDs on all 25 lines (for DTE and DCE devices), it shows the signal status (mark, space, clocking and off) of all lines at the same time. LEDs are powered by signal activity, so their intensity provides a relative idea of signal strength. Each line can be interrupted with in-line dip switches. Use single and gang jumpers for signal rerouting.

Use this device for Ethernet testing. Placed in line between the transceiver and the workstation, CableMaster 1000 monitors IEEE 802.3 signals on the AUI interface. The tester has four LEDs that show transmit and receive signal activity plus collisions and power. In



addition, it provides four buffered TTL level outputs and a ground reference as test access for the attachment of other analysis equipment.

This test set is powered by four 9-V Duracell alkaline batteries. CableMaster 100 may now be ordered individually at a greatly reduced price. The optional Accessory Kit includes 3-foot dual gender DB25 25-conductor cable, 3-foot dual gender DB15 15-conductor cable, 3-foot straight-through UTP cable with RJ45 connectors, 3-foot 62.5/125-μm fiber optic reference cable with ST connectors, breakout box jumpers, nylon carrying case with belt loops and user manual. This 2.9-pound unit is 3.5" x 2.5" x 11". Two-year warranty.

50311 CableMaster 1000

621X311 1-2, \$690.00 ea.; 3-up, \$625.00 ea.

50312 Optional Accessory Kit

621X312 1-2, \$295.00 ea.; 3-up, \$265.00 ea.

CableMaster 1000 Specifications

Processor:	PIC16C57
Connectors	
Fiber Optic:	Dual ST connectors
Cable Tester:	One each female (D Type) nine, 15 and 25 conductor; two each female RJ45; one each male (D Type) 15 and 25 conductor
Printer Port:	Nine conductor female (D Type)
Breakout:	Same as Cable Tester
Ethernet:	One each 15-conductor male and female AUI connector (D Type)
Interfaces	
Fiber Optic:	TS055A
Cable Tester:	DC continuity for eight-, nine-, 15- and 25-conductor cables
Breakout:	Single-ended, RS232C/V.24 type
Ethernet:	AUI
Printer:	RS232C/V.24 ASCII async, output at 9600 bps, eight bit, one start bit, one stop bit, no parity

Model 24-515 Multi-Network Cable Tester

Network Cable Remote Testing System

- Autoscan wire continuity, miswiring and polarization
- Remote terminator tests cable before or after installation
- Test the ground of shielded twisted-pair cables
- Includes BNC female and RJ-45 test jacks

The new Multi-Network Cable Tester from AIM Electronics is designed for quick testing by auto-scanning wire continuity, miswiring and polarization in your network cables. Use it on thin Ethernet (BNC), 10BASE-T (UTP/STP), TIA-568A/TIA-568B and eight-position Token Ring. An attached remote terminator simplifies cable testing before or after cable installation. The Multi-Network Cable Tester also allows you to test the ground of shielded twisted-pair cables.

BNC female and RJ-45 test jacks provided. Includes main unit and remote terminator in a leather zipper pouch. The 1-pound kit is 6" x 4" x 1.5". Ninety-day warranty.

053X190 24-515 Cable Tester 1-11, \$124.00 ea.; 12-up, \$112.00 ea.



LAN Tester Selection Guide

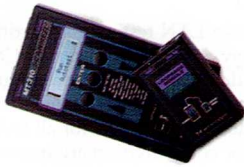
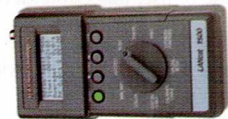


Features	Microtest PentaScanner 350	Fluke DSP-100	Microtest Penta Scanner+	Datacom Technologies LANcat V	Scope Com. WireScope 155	Wavetek LT-ProXL	Datacom Netcat 2200
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Level II Accuracy	✓	✓	✓	✓	✓	✓	
Near-End Crosstalk							
Range	0.7-100 MHz	0.1-105 MHz	0.7-100 MHz	1-100 MHz	1-155 MHz	1-102 MHz	5-20 MHz
Sensitivity	75 dB	60 dB	60 dB	60 dB	62 dB	70 dB	40 dB
Signal Attenuation							
Range	1-100 MHz	0.1-105 MHz	1-100 MHz	1-100 MHz	1-155 MHz	1-102 MHz	5-20 MHz
Sensitivity	50 dB	60 dB	50 dB	60 dB	25 dB	50 dB	40 dB
Time Domain Reflectometer (TDR)							
Accuracy	4%	4%	4%	1%	4%	2%	3%
Resolution	1'	1'	1'	1'	2'	0.33'	1'
UTP Range (Feet)	0-3000	0-4000	0-3000	5-2000	10-3000	0-2000	20-2000
Coax Range (Feet)	0-4000	10-4000	0-4000	5-4000	10-3000	0-2000	20-4000
Diagnostics							
ACR	✓	✓	✓	✓	✓	✓	✓
Impulse Noise	✓	✓	✓	✓	✓	✓	✓
DC Loop Resistance	✓	✓	✓	✓	✓	✓	
Characteristic Impedance	✓	✓	✓	✓	✓	✓	✓
Miscellaneous Tests							
Fiber Optic Option				✓	✓	✓	✓
NetWare Testing							✓
NIC Testing							✓
Performance Grading	✓						
Two-Way Injector Option	✓	✓	✓	✓	✓	✓	✓
Detects Opens, Shorts and Split Pairs	✓	✓	✓	✓	✓	✓	✓
Tests Stored	500	500	500	500	500	500	500
Traffic Monitor	✓	✓	✓	✓	✓	✓	✓
Wire Map	✓	✓	✓	✓	✓	✓	✓



LAN Tester Selection Guide



Features	Microtest MT 350	Fluke 652	LANcat 1800	Fluke 650	LANcat 1500	Microtest MT 310	Datacom Netcat 800
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Level II Accuracy							
Near-End Crosstalk							
Range	0.2-20 MHz	6-20 MHz	6-20 MHz	5-10 MHz	5-16 MHz		5-16 MHz
Sensitivity	60 dB	48 dB	48 dB	40 dB	55 dB		40 dB
Signal Attenuation							
Range	0.2-20 MHz	5-20 MHz	5-20 MHz	5-10 MHz	5-16 MHz		5-16 MHz
Sensitivity	50 dB	48 dB	48 dB	40 dB	22 dB		20 dB
Time Domain Reflectometer (TDR)							
Accuracy	4%	1%	1%	1%	4%		1%
Resolution	2'	2'	2'	2'	2'		✓
UTP Range (Feet)	20-2000	20-2000	20-2000	20-2000	20-1000		20-2000
Coax Range (Feet)	20-4000	0-4000	0-4000	0-4000	20-1000		20-4000
Diagnostics							
ACR					✓		
Impulse Noise	✓	✓	✓	✓			✓
DC Loop Resistance							
Characteristic Impedance	✓	✓	✓				✓
Miscellaneous Tests							
Fiber Optic Option							
NetWare Testing							
NIC Testing							
Performance Grading							
Two-Way Injector Option							
Detects Opens, Shorts and Split Pairs	✓	✓	✓	✓	✓	✓	✓
Tests Stored	50	500	500	50	1		0
Traffic Monitor	✓	✓	✓	✓	✓	✓	✓
Wire Map	✓	✓	✓	✓	✓	✓	✓



Model DSP-100

Digital LAN CableMeter

- The most accurate field tester on the market
- Cutting-edge tool meets Category 5 standard
- Only tester designed to meet TIA Level II accuracy requirements
- Graphic display with cursor pinpoints fault isolation
- Digital signal processing algorithms analyze captured signal
- Update software with Flash EPROM technology in internal data base
- Optional smart remote measures two-way NEXT

Model DSP-100 is the new rugged, hand-held Fluke LAN testing and certification tool that employs breakthrough digital technology. Now you can certify Category 5 UTP cabling installation with speed and confidence. Using exclusive digital technology, the Fluke DSP-100 is the first and only tester specifically designed to meet the proposed stringent new TIA Level II accuracy requirements for all link types. Specifications for NEXT accuracy and connector compensation are traceable to NIST. Finally you can test with a confidence level up to 60 times higher than with older Level I testers. With 100-MHz speed, accuracy, diagnostics, two-way NEXT (with optional Smart Remote), reliability and ease of use, this CableMeter is your cutting-edge answer to Category 5 cable testing.

The advantages of DSP-100 are clear cut. You can cut installation time by Autotesting four-pair UTP cables in less than 20 seconds. That's more than twice as fast as any other tester — and it does a more thorough job too. The unique NEXT Analyzer™ quickly pinpoints bad cables by locating the exact source of crosstalk. This CableMeter provides over 1000 frequency points. It measures NEXT between each combination of pairs in a twisted-pair link over a frequency range of 100 kHz to 105 MHz and analyzes test results in 100-kHz step size.

Fluke's patented Time Domain Crosstalk Analyzer instantly pinpoints faults such as poor connectors, bad workmanship or marginal cabling. Free DSP-LINK™ software lets you upload test results data to your PC in less than two minutes. Store test results for up to 500 links for later printing or downloading to a computer. Legendary Fluke ease of use is built in. Even better, customer support is free.

Digital test technology delivers superior performance. The DSP-100 uses a truly revolutionary test technique. To measure the critical parameter of NEXT between two pairs, it sends a pulse that very closely resembles 100-Mbps LAN signals into one pair and captures the signal induced on the other pair as a result of the crosstalk between these two pairs. The captured signal is analyzed using Digital Signal Processing algorithms to provide a very accurate picture of NEXT in both frequency and time domain. The time domain profile pinpoints the distance to the location of the problem(s). Since one pulse replaced hundreds of test frequencies, DSP-100 is extremely fast yet offers unmatched accuracy.

CableMeter supports two-way NEXT measurements of installed network cable, required by the link standard, in two ways. Using two DSP-100 testers, test results are transmitted to and evaluated by tester in charge and automatically consolidated into one test report. Or use a convenient, time-saving Smart Remote included with the DSP-100/SR CableMeter. This Smart Remote tests near- and far-end crosstalk from the same end of the cable without having to interchange the two devices. It also offers the unique feature of computing ACR values based on measurements at each frequency point (100-kHz step size) from both ends of the cable.

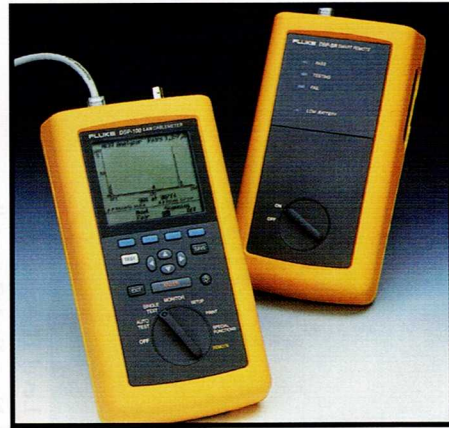
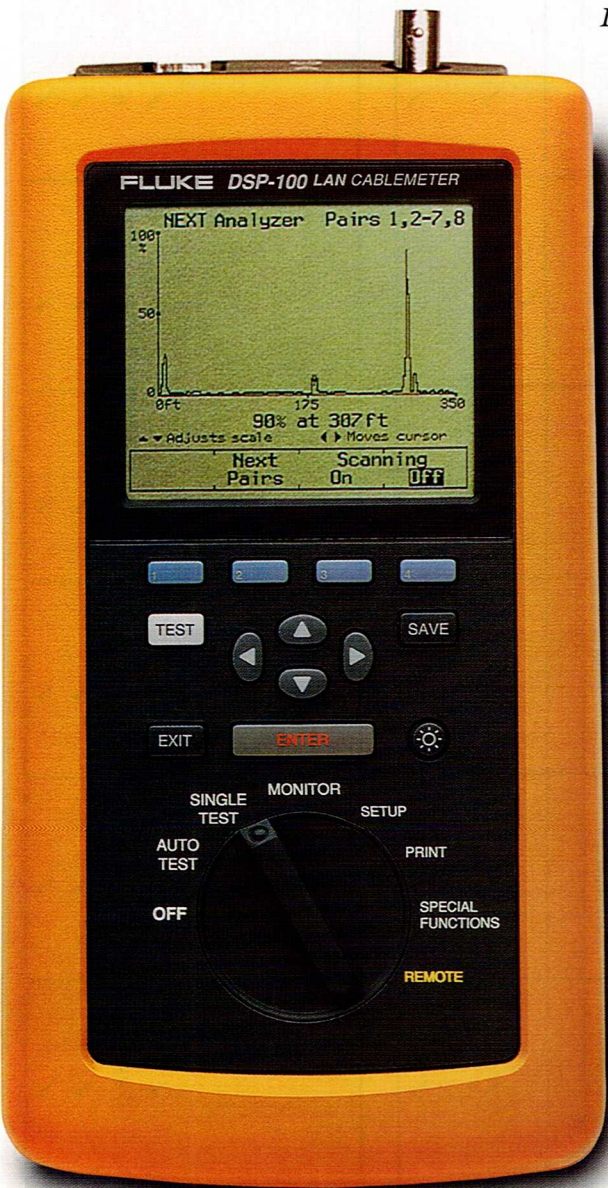
Operation is easy with rotary knob plus up and down arrow keys. Graphic LCD with back light is 240 x 200 bit mapped. Test connections are RJ45 (shielded) and BNC. Protected against continuous telco voltages and 100-mA overcurrent. High-impact plastic case features shock-absorbing Fluke yellow overmold.

The DSP-100 includes a Standard Remote. Model DSP-100/SR includes a DSP-SR Smart Remote with ac adapter and soft case. The main meter and Smart Remote use rechargeable ni-cad batteries with 10- to 12-hour battery life. They may be charged while in the unit, while operating or off-line. Battery eliminator is included. Each 3.1-pound unit is 9.25" x 5" x 3". One-year warranty.

045X925 DSP-100 CableMeter with Standard Remote1-2, \$3790.00 ea.; 3-up, \$3640.00 ea.
045X926 DSP-100/SR CableMeter with Smart Remote1-2, 4990.00 ea.; 3-up, 4795.00 ea.

DSP-100 Specifications

Cable Types:	Unshielded twisted-pair LAN cables of all categories (UTP Category 3, 4 and 5); foil-screened twisted-pair cables (Category 3, 4 and 5); shielded twisted-pair cables (IBM Type 1, 6 and 9); coaxial cables (Thicknet 10BASE-5, Thinnnet 10BASE-2, RG-58, RG-58 foam, RG-59, RG-59 foam, RG-62)
Test Standards:	TIA Cat 3, 4 and 5, Basic Link or Channel, TIA TP-PMD; IEEE 10BASE-5, 10BASE-2 and 10BASE-T; IEEE Token Ring 4 Mbps or 16 Mbps; IEEE 100BASE-TX, 100 BASE-T4, IEEE 802.12 (100BASE-VG), 4-UTP and 2-STP; ISO Class A, B, C or D
Common Tests:	Autotest, wire map, characteristic impedance, length, propagation delay, dc loop resistance, attenuation, NEXT, residual NEXT, random noise floor, ACR and SRL





LANcat® V Series

Configuration	Performance Module
Basic Link	Modular Plug (standard)
Channel	Modular Jack (optional)
Test Configurations	
TIA TSB-67 Basic Link Category 3, 4, 5	
TIA TSB-67 Channel Category 3, 4, 5	
ISO IEC 11801 Class C/D	
10BASE-T	4/16 Mbps Token Ring
100BASE-Tx	10BASE2 Coax*
100BASE-T4	10BASE5 Coax*
100BASE-VG	RG-58 Coax*
TP-PMD	RG-59 Coax*
ATM 155	RG-62 Coax*
* Requires optional Coax Module	

LANcat® V Series Cable Testers

The Best Choices for Cat 5 Cable Certification

- Precision Level II accuracy per TIA TSB-67
- Store up to 1000 test records
- Windows PC interface
- Hardware/flash ROM upgradeable

LANcat® V Series Cable Testers are the most accurate, reliable handheld instruments for testing and certifying LAN cable with accuracy exceeding Level II requirements per TIA TSB-67. Plug-in Performance Modules adapt to different test configurations and cable types for uncompromised results. Test basic link and channel configurations without external adapters that can cause measurement error. Modules provide an optimized interface to the link and minimize measurement error for both test conditions. Support all common cable types including UTP (Cat 3,4,5), STP, ScTP, Thin and Thicknet plus other coax. Store autotests with user-assigned circuit ID, company name and date stamp. Output results later to serial printer or upload to PC (up to 38,400 baud) using Windows. Select pre-formatted report for printout or ASCII characters in CSV format for upload to database/spreadsheet program.

Compact, robust instruments include all important functions needed to test Category 5 cable per Link Performance Test Standard. Autotest performs wire map (four pair plus shield), NEXT, attenuation, length via TDR, ACR, impedance anomalies and propagation delay. Run each test individually for diagnostic purposes. The basic model tests one-way NEXT. Use two-way system to test NEXT at both ends automatically with a single test setup. Impedance anomalies test detects up to three impedance discontinuities for isolating cable damage. Quick Check is an abbreviated autotest that verifies link integrity without taking the time for a complete certification test. In less than 7 seconds, it performs wire map, length, NEXT, attenuation, ACR and propagation delay. Count impulse noise hits above user-defined threshold of 11-500 mV peak (260-mV default). Ethernet Traffic monitors live network activity and reports percent utilization, percent collisions and peak traffic.

A unique 10-position rotary function selector simplifies testing, even for inexperienced users. Just turn the dial to Autotest and observe the results with no confusing keypads and multi-layer menus to slow you down. Summary and detailed test results including performance plots, if desired, are clearly displayed on the a large, brightly backlit graphic display. The two-way model is the only Category 5 cable tester with a full graphic display remote. This unit provides remote operator with testing status and test results detail so link problems can be corrected quickly.

Only the LANcat V Series offers the convenience of operation from common alkaline AA cells or optional rechargeable Nickel Metal Hydride (NiMH) battery pack. Battery life is eight to 10 hours of continuous use or over 800 autotests. Automatic power-down is user-selectable from 2 to 30 minutes. Only the LANcat V Series provides for in-field upgrading of hardware and software to stay current with future test requirements. Enhance hardware performance with additional plug-in Performance Modules which contain critical circuitry that determines performance and accuracy. With built-in Flash ROM, firmware upgrades are as simple as connecting to a PC.

The LANcat V Cable Tester is the economical choice for LAN administrators and field service providers for testing twisted-pair cable up to 100 MHz. Test NEXT one way and store 500 autotest results plus one traffic report. Includes Modular Plug Performance Module for basic link testing, standard one-way remote, 12 AA alkaline batteries (eight for main, four for remote), ac adapter/battery eliminator, patch cable, PC interface cable,

rugged carrying case, certificate of calibration, field calibration standard and manual. Optional Modular Jack Performance Module is required for Channel testing (instrument connects to user patch cords). Optional Coax Performance Module with BNC 50 connector is required

for coaxial cable testing. Other accessories adapt to IBM Type 1 cable and N Series (thicknet coax) connectors. The 1.9-pound main unit is 3.9" x 9.6" x 2.5"; the 1.1-pound remote is 3.5" x 6" x 1.9". One-year warranty.

Installers prefer the LANcat V-TwoWay Cable Testing System to certify Category 5 cable. It automatically measures NEXT from both ends of cabling link. Both the main and two-way remote units have large, backlit graphic LCD displays for reviewing test status and results. Store 1000 autotest results plus one traffic report. Includes two Modular Plug Performance Modules for basic link testing, 16 AA alkaline batteries (eight for main, eight for remote), two ac adapter/battery eliminators, PC interface cable, rugged carrying case, certificate of calibration, field calibration standard and manual. Two optional Modular Jack Performance Modules are required for Channel testing (instrument connects to user patch cords). Optional Coax Performance Module with BNC 50 connector is required for coaxial cable testing. Other accessories adapt to IBM Type 1 cable and N Series (thicknet coax) connectors. The 1.9-pound main and two-way remote units are 3.9" x 9.6" x 2.5". One-year warranty.

415X585 52418 LANcat V Standard Cable Tester

REGULAR PRICE\$3065.00 ea.

SPECIAL PRICE\$2665.00 ea.

415X599 54524 LANcat V Two-Way Cable Testing System

REGULAR PRICE\$4095.00 ea.

SPECIAL PRICE\$3555.00 ea.

415X871 54456 Modular Jack Performance Module.....\$175.00 ea.

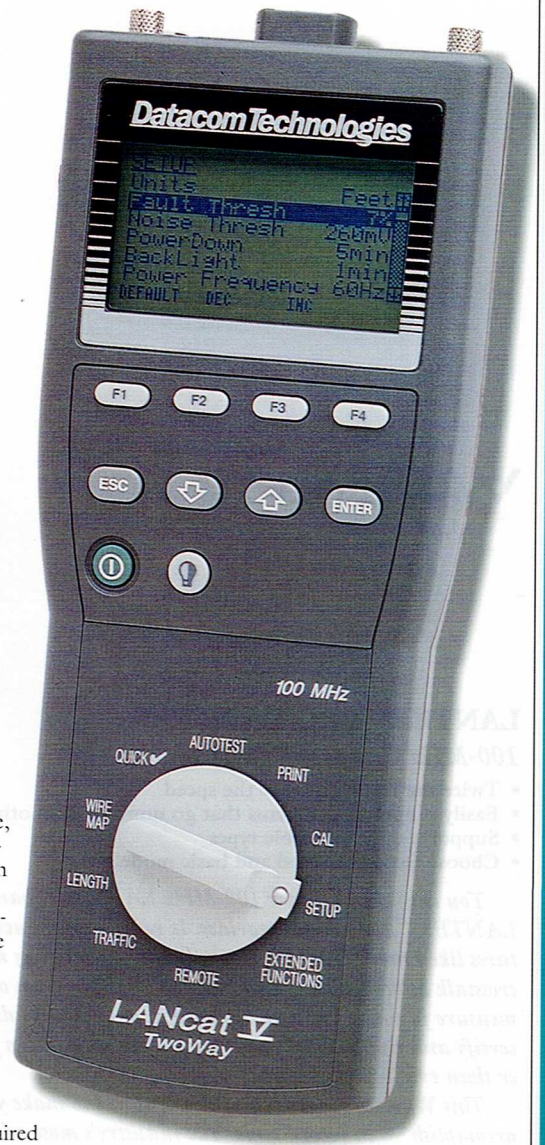
415X880 54458 Coax Performance Module130.00 ea.

415X892 54459 NiMH Rechargeable Battery Pack160.00 ea.

415X708 52181 BNC to N Series Adapter for Testing 10BASE5.....\$35.00 ea.

415X750 52404 Token Ring (RJ45-Data Connector) Adapter Kit...\$95.00 ea.

415X761 52405 Token Ring (RJ45-DB9 Connector) Adapter Kit...\$55.00 ea.



WAVETEK

LANTEK™ PRO Series

100-MHz Category 5 LAN Testers

- Twice the features, twice the speed
- Easily pinpoints problems that go unnoticed on other testers
- Supports over 200 cable types
- Choose from enhanced and basic models

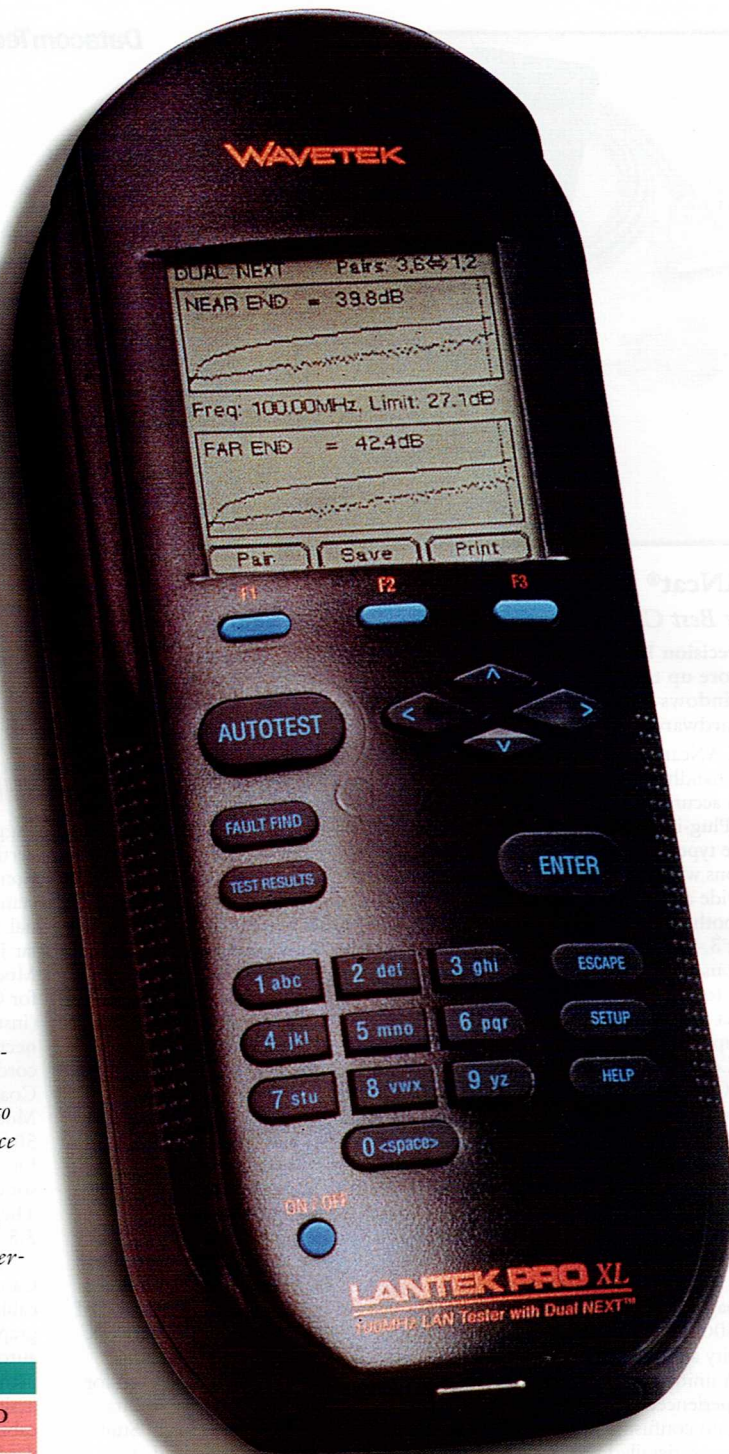
You can't buy a faster 100-MHz LAN tester than the LANTEK™ PRO Series provides. It redefines productivity with features like Dual NEXT™, automatically measuring near-end crosstalk at both ends of a connection — faster than other testers measure just one. With an Autotest of only 40 seconds long, you can certify and troubleshoot your Category 5 installation faster and easier than ever before.

This Wavetek series is carefully designed to make your job easier to accomplish — in record time. The industry's most advanced two-piece tester features a 160 x 160 graphical display that provides complete test records with simple pass/fail screens or detailed diagnostics. LANTEK PRO Series supports over 200 cable types including UTP and STP for Category 3-5, ISO (Class B, C and D), CATV and user-specified cabling. Store up to 500 tests. These LAN testers meet or exceeds all TIA requirements for both Level I and Level II testing.

LANTEK PRO Series Specification Comparison		
FEATURES	LANTEK PRO XL	LANTEK PRO
Autotest Time	35 Seconds	35 Seconds
Dual NEXT™	Yes	Yes
Autotest Suites (reporting Pass/Fail for each)	Line Mapping Length DC Loop Ω Capacitance Attenuation Dual NEXT ACR	Line Mapping Length DC Loop Ω Capacitance Attenuation Dual NEXT ACR
Cable Expert™	Yes	Yes
TDR (Impedance vs. Length)	Yes	No
Average Noise (for EMI, RFI)	Yes	No
Test Storage*	500	500
Graphical Display	160 x 160	160 x 160
Flash EEPROM	Yes	Yes
Cable Types Supported**	150	150
AutoSave/AutoPrint	Yes	Yes

* If Fault Find graphs are saved in memory, the 500 test limit may be reduced.

** Includes but is not limited to UTP and STP for Category 3-5, ISO (Class B, C and D), CATV and user-specified cabling. Specifications subject to change.



The LANTEK PRO and XL versions each include a display handset (with integrated NEXT injector and battery pack), a remote handset (terminator with NEXT injector and battery pack) plus a dual-bay battery charger (with wall cord and dc power cord). Each unit runs on replaceable, rechargeable ni-cad batteries. Typical battery life is eight hours for the display handset and 14 hours for the remote. Batteries recharge in three hours or less. Each set also contains test lead set, serial printer/PC cable and adapter, utility software package for data upload, storage and printing plus user's guide. All this is packaged in a rugged, compact, nylon carrying case with adjustable shoulder strap.

Choose from two models and an accessory package. The 1.75-pound display handset is 10" x 4.25" x 2.5". The 1.6-pound remote handset measures 10" x 4.25" x 2.5". One-year warranty.



LANTEK™ PRO XL and LANTEK™ PRO

100-MHz Category 5 LAN Testers

- Choose from upgraded LANTEK™ PRO XL and LANTEK™ PRO Basic Tester versions
- Optional LANTEK PRO Kit of additional accessories for either version

Wavetek makes a LANTEK™ PRO Series LAN Tester to meet your specific needs. Choose from the upgraded LANTEK PRO XL or the basic LANTEK PRO. An optional LANTEK PRO Kit of useful additional accessories will round out either Wavetek test system.

LANTEK PRO XL is the ideal enhanced tool for robust diagnostic post-installation testing. It provides impedance and expert troubleshooting. This top-of-the-line model automatically tests cable length, loop resistance and impedance, plotting a graphic report of the cable's electrical behavior. Autotest goes even further to measure line mapping, mutual capacitance, attenuation and bi-directional NEXT.

The XL model is the ultimate cable diagnostic device. For network managers, technicians and third-party service providers, LANTEK PRO XL takes the headache out of resolving difficult network problems. At a glance, you can determine if the cabling is at fault or if the problem lies elsewhere. Handle new requirements of emerging standards with the fastest, most accurate autotest in the industry. No other system has Cable Expert™ and powerful TDR technology to pinpoint problems that go unnoticed on other testers. You get a graphic display of all the important electrical characteristics in one easy-to-read picture. With built-in Flash ROM, future upgrades are as simple as connecting to a PC.

Wavetek's **LANTEK PRO** was developed primarily as a basic tester for the performance verification needs of contractors and installers. While it retains many of the diagnostic capabilities found in the enhanced XL model, the LANTEK PRO incorporates features necessary for fast production testing of new network installations. Organizations performing both installation and maintenance would benefit from having both versions in this series.

The optional **LANTEK PRO Kit** quickly and easily rounds out your test system with several helpful accessories. It contains 110 block test leads, installed patch cable test leads, Cable Management System (CMS) Software and two spare ni-cad battery packs in a rugged, hardened carrying case. It also can accommodate either the LANTEK PRO XL or LANTEK PRO and a printer for one complete, easy-to-carry testing package. One-year warranty.



LANTEK™ PRO XL LAN Tester

203X570 (Regular Price)\$4620.00 ea.
SPECIAL PRICE\$4092.00 ea.

LANTEK™ PRO Basic Tester

203X568 (Regular Price)\$4120.00 ea.
SPECIAL PRICE\$3649.00 ea.

203X580 LANTEK PRO Accessory Kit\$890.00 ea.

FS850-ST FIBERKIT

Fiber Optic Loss Measurement Accessory Kit

- Adds fiber capability to LANTEK™ PRO Testers
- Includes light source and fiber power meter
- Tests all kinds of cable

With the new FIBERKIT, the LANTEK™ PRO Series directly displays optical power loss through fiber cable, splices and connectors. With this powerful yet simple fiber conversion, you can verify proper installation of the fiber cabling with the same LANTEK PRO you use for copper cable. FIBERKIT offers all the advantages and accuracy of a conventional power meter at a much lower price.

With a simple and rugged fiber power meter attached directly to the LANTEK PRO, you can detect and measure loss caused by common fiber optic cable problems including poor splices, bending losses, broken fibers and fiber-type mismatch.

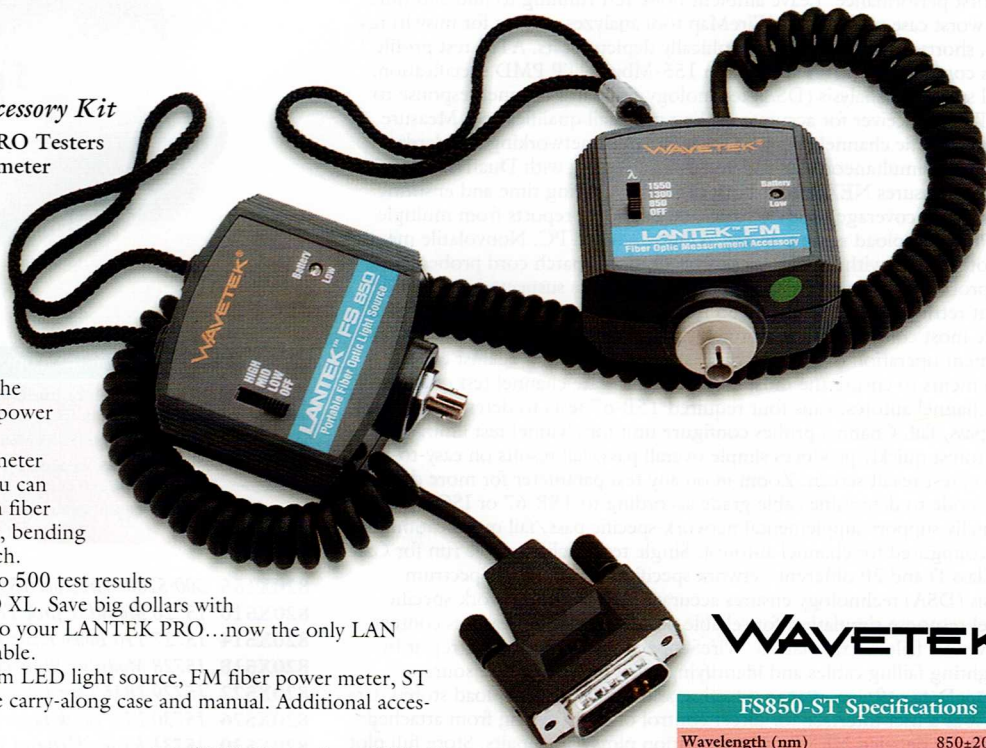
Display, store, print and download up to 500 test results with the LANTEK PRO or LANTEK PRO XL. Save big dollars with the convenience of adding fiber capability to your LANTEK PRO...now the only LAN cable tester capable of testing all kinds of cable.

This optional kit includes FS850 850-nm LED light source, FM fiber power meter, ST optical adapter, ST connector cord, durable carry-along case and manual. Additional accessories are optional. One-year warranty.

203X220 FIBERKIT 850-ST1-2, \$895.00 ea.; 3-up, \$849.00 ea.

Optional Accessories

203X225 FS 1300-ST 1300-nm Light Source\$599.00 ea.
203X738 ST Adapter\$69.00 ea.
203X214 FC Adapter\$69.00 ea.
203X726 SMA Adapter\$69.00 ea.
203X709 SC Adapter\$69.00 ea.



WAVETEK

FS850-ST Specifications

Wavelength (nm)	850±20
Output (dBm)	
Typical	-16.0
Minimum	-18.5
Stability over 10 Hours (dB)	±0.06
Temperature Stability (dB/°C)	±0.35
Battery Life	10 hours
Operating Temperature	-20 to +50° C
Storage Temperature	-35 to +70° C





WireScope 155 Product Kit

First Cable Tester with 155-MHz Frequency Range

- Fast and accurate basic link testing
- Comprehensive channel testing
- Qualifies the channel for 20 different network specifications
- Covers 155-MHz frequency range
- Runs 155-Mbps ATM test profile

WireScope 155 tests installed cabling for compliance with TIA 568A Category 5 and ISO 11801 Class D specifications. It fully implements TIA TSB-67 requirements including laboratory-grade Level II measurement accuracy. The first 155-MHz field cable analyzer to qualify Category 5 cabling fully for ATM, it covers extended-frequency range employed by 155-Mbps ATM equipment.

Optimized for basic link and channel testing, probes automatically define the tester for both configurations. Auto-troubleshooting mode for failing cable runs identifies probable error sources for quick problem isolation and repairs. TIA TSB-67 specification for Cat 5 field testing defines two test configurations for most common cable tests. It defines separate pass/fail limits for basic link and channel.

Analyze marginal cable runs and find which pair combinations offer best and worst performance. Leave ambient noise test running to find and time-stamp worst case noise levels. WireMap tool analyzes cabling for miswirings, breaks, shorts or split pairs and graphically depicts faults. ATM test profile verifies compliance with ATM Forum 155-Mbps UTP PMD specification. Digital spectrum analysis (DSA) technology simulates channel response to real ATM transceiver for accurate cabling pass/fail qualification. Measure network-specific channel response for high-speed networking standards.

Perform simultaneous far-end and NEXT testing with DualRemote 155. Autotest measures NEXT from both cable ends, saving time and ensuring complete test coverage. Locally store 500 cable test reports from multiple sites. Print or upload reports to any Windows-based PC. Nonvolatile memory protects data without battery power. Optional patch cord probe zeroes in on problems. Main tester's loopback test qualifies suspected patchcords without retrieving DualRemote 155 from far end for speedy fault isolation.

The most comprehensive channel testing available ensures real network equipment operation over entire cable run. Test channels against cabling requirements to ensure the most complete, accurate channel test qualification. Channel autotest runs four required TSB-67 tests to determine overall Cat 5 pass/fail. Channel probes configure unit for channel test limit.

Autotest quickly produces simple overall pass/fail results on easy-to-read top-level test result screen. Zoom in on any test parameter for more detail. Select mode to determine cable grade according to TSB-67 or ISO 118. Optionally support supplemental network-specific pass/fail qualification when configured for channel autotest. Single test qualifies cable run for Cat 5 or Class D and 20 different network specifications. Digital Spectrum Analysis (DSA) technology ensures accurate high-speed network-specific channel response simulation for reliable pass/fail testing. Features context-sensitive test failure explanation. WireScope 155 simplifies cable repair by highlighting failing cables and identifying most probable error sources.

ScopeData software manages testing and results data. Upload stored data or use it as a user interface for direct control of cable testing from attached PC. Display detailed NEXT and attenuation plots for all pairs. Store full plot data. Test report creation and printing is quick and easy. Download entire day's test results (up to 500 reports) to PC for instant formatting in under five minutes. Print reports immediately or save for later printing.

Kit includes WireScope 155, DualRemote 155, field-replaceable test probes and rechargeable batteries plus solid rubber boot for shock protection. Detachable test probes protect unit against damage and connector wear. The 1.3-pound unit is 7.5" x 4" x 2". Accessories optional. One-year hardware and software maintenance warranty; 30-day test probe warranty.



WireScope 155 Specifications

Near-End Crosstalk (Tests all 24 Pair Combinations) Frequency Range: 1-155 MHz
Attenuation Frequency Range: 1-155 MHz
Ambient Noise: Continuously monitors and reports broadband and impulse ambient noise
Wire Map: Identifies miswires, shorts, opens, reversals and split pairs

Cable Length (TDR): Measures length of each pair and distance to faults

Propagation Delay Measurement: Independently measures one-way propagation delay for each of four pairs

Memory: Up to 500 Autotests

820X155	500-5200 WireScope 155 Kit..1-2, \$4985.00 ea.; 3-up, \$4735.00 ea.
820X510	15726 Modular Jack Test Probe .....60.00 ea.
820X514	15727 110 Block Basic Link Test Probe for 568A.....80.00 ea.
820X518	15728 Modular Plug Test Probe .....60.00 ea.
820X522	15729 IBM Type 1 Test Probe .....80.00 ea.
820X526	15730 BIX Block Basic Link Test Probe for 568A.....80.00 ea.
820X530	15731 Krone HiBand Basic Link Test Probe for 568A.....80.00 ea.
820X534	15740 110 Block Basic Link Test Probe for 568B.....80.00 ea.
820X538	15745 Krone HiBand Basic Link Test Probe for 568B .....80.00 ea.
820X542	15750 BIX Block Basic Link Test Probe for 568B .....80.00 ea.
820X020	450-0015 Self Test Probe .....80.00 ea.
820X170	500-5230 Channel/Patch Cord Test Probe.....150.00 ea.
820X180	500-5250 Professional Probe Kit.....395.00 ea.
820X160	525-1510 Removable Battery Pack .....75.00 ea.





MT350 Scanner Value Kit

Advanced Network Cable Certification Tool

- Ideal for intensive, all-day, on-site use
- Autotest certifies multiple network types
- Prints certification reports, NEXT plots and test results

MT350 Scanner incorporates sophisticated cable diagnostic and certification technology in a hand-held instrument. It's a high-performance tool for installers, LAN technicians and network managers responsible for large sites or multiple LANs. Certify if new or existing UTP, STP or coax cable will support Ethernet, 10BASE-T, 4/16 Mbps token ring and ARCnet networks or multimedia transmission. Cable type library includes AT&T®.

Technological advances offer greater control and increased flexibility. Use default tests or define your own parameters. MT350 documents installation, additions, moves and changes. Built-in Autotest easily certifies cables and pinpoints out-of-spec results. Advanced functionality such as RJ-45 connector crosstalk cancellation and extended dynamic range quickly determine cable levels.

MT350 performs wire map and measures NEXT, attenuation, cable length, resistance, noise and distance to faults. It pinpoints opens, breaks, shorts and miswirings in seconds. All wire pairs are tested and ranked by performance. Also monitors LAN traffic, maps wiring connections and activates 10BASE-T hubs. It determines distance to punch-down blocks, connectors and faulty patch cables. Download up to 50 test results to CMS database. Maintains up-to-date electronic records of all cable parameters and results. Print stored certification reports, NEXT plots and test results on demand.

Features audio and visual continuity indicators, 16-character two-line LCD, 18-key keypad with tactile feedback and color-coded cable setup, Piezo electric speaker with 3000-Hz pulse and continuous tones, noise threshold, scanning alarms and network monitor. Replaceable, rechargeable batteries enable intensive, all-day, on-site use. Flash ROM allows instant field upgrades. Download enhancements and options anywhere there's a PC and modem with Microtest's bulletin board system.

This 1.5-pound unit is 4" x 7.5" x 1.75". The 4.8-pound kit includes MT350 Scanner with black impact cover, Super Injector, replaceable rechargeable battery, ac adapter, two Category 5 patch cables and manual in a small soft carrying case. Cable Management System and PC Autostore Software programs are free on receipt of registration. One-year warranty.

800X860 8100-01 MT350 Scanner Value Kit (Regular Price).....\$2395.00 ea.
SPECIAL PRICE.....\$1985.00 ea.

Microtest

MT350 Scanner Specifications

Measurement	Range/Test
Distance	Coax: 20-4 k ft. Twisted Pair: 20-2 k ft.
Attenuation	Worst case on all four pairs Using one-way IEEE/EIA spec
NEXT	0.2-20 MHz in 100-kHz steps
Resistance	0.2-2.5 k
802.3 and 10BASE-T Network Monitor	

Microtest

MT310 Scanner Kit

The UTP Troubleshooter

- Affordable, basic troubleshooting and certification
- TDR reflectometry pinpoints UTP cabling problems
- Print latest autotest results or download to database

Microtest's MT310 Scanner™ is designed as the low-cost solution for LAN administrators, technicians or small-site cable installers with basic unshielded twisted-pair (UTP) troubleshooting and certification needs. It utilizes Microtest's patented TDR reflectometry to pinpoint cabling problems on UTP networks. Model MT310 runs a series of tests to determine if your UTP cabling meets industry standard specifications for 10BASE-T or token ring networks. A pass or fail indication is automatically given. The latest Autotest results can be printed to any 9600 baud serial printer or simply downloaded to any database.

The MT310 Scanner runs individual tests and measurements including near-end crosstalk, attenuation, length, noise and

signal to crosstalk ratio. It also locates common cabling faults such as breaks and shorts. A wire map test instantly pinpoints improperly wired connectors and swapped pairs plus opens, shorts and miswires.

Other functions include print autotest results, store 1 autotest result, print stored results, calibrate TDR (set and learn NVP) and set configuration (net type, output type and units). Results are clearly displayed on a 16-character, two-line LCD.

The MT310 kit includes scanner with impact cover, loopback module, 3-foot RJ-45 low crosstalk patch cable, 9-volt alkaline battery, soft carrying case and user guide. This 1-pound unit measures 7.5" x 4" x 1". One-year warranty.

800X850 8060-00 MT310 Scanner Kit (Regular Price).....\$955.00 ea.
SPECIAL PRICE.....\$785.00 ea.



PentaScanners

The Ultimate Category 5 Cable Testers

- The most accurate handheld field cable testers available
- Exceed all accuracy requirements for TSB-67 Level II field testers
- Certify 200 cable types and store up to 500 autotests
- Simultaneously analyze and certify multiple network types
- Choose from PentaScanner+ and PentaScanner 350 versions

Microtest has upgraded its popular PentaScanner into a complete line of super precise kits for certifying and maintaining Category 5 cable installation. Three PentaScanner+ versions and the new PentaScanner 350 with Performance Grading are the ultimate solutions for quick, reliable network cable testing by cable installers, service providers and network managers.

The PentaScanner+ features user-selectable cable grading performance to EIA-568A Category. It exceeds all minimum accuracy performance requirements for Level II field testers as specified in the TIA/EIA Draft TSB-67. Another innovation in leading-edge technology, PentaScanner 350, adds the unique of benefit Performance Grading for 350-MHz cable. Microtest's new model ranks high-band cable to differentiate marginally compliant Category 5 links from superior performance links. It measures and rates link quality by analyzing headroom available for high-speed applications. PentaScanner 350 is the only Cat 5 field tester and certification tool capable of maintaining TSB-67 Level II accuracy through Quality Band 7 (25.7-28.6 dB ACR equivalent at 100 MHz; 47.3-50.2 dB NEXT equivalent at 100 MHz). This breakthrough is even more impressive because the TSB-67 developers never intended making accurate measurements past the first one or two Quality Bands. But now the 350 can be used down at the seventh Quality Band which includes power levels 64 times fainter than Quality Band 1.

Each scanner offers the most accurate 100-MHz test system available today. There is no faster way to certify and maintain Category 5 and ISO Class D cabling systems. Advanced features assure you of state-of-the-art performance and unsurpassed accuracy. Test UTP (Cat 1-5), coax and STP/ScTP cable. Perform comprehensive one-step Autotests with date and time stamp of all tests. Store up to 500 separate Autotests for later retrieval. A network monitor skyline graph is easy to use. The sapphire-blue backlit display screen features a graphical user interface. Arrow keys and descriptive menu options guide you quickly and easily through installation, certification and troubleshooting procedures of cable runs. On-line help provides instant answers to avoid time-consuming searching through the manual. Tone generation audio provides warnings and other user feedback.

Measure near-end crosstalk (NEXT, all six pair combinations) and attenuation-to-crosstalk ratio (ARC) from both ends of the installed network cable link. Other measurements include attenuation (all four pair combinations plus the shield), wire map, length, impedance, loop resistance, noise and capacitance. Also find intermittent faults. The zero TDR dead zone finds close faults within 20 feet. These Category 5 testers offer 20 user-definable test limits. They print complete, easy-to-read certification reports. Flash ROM firmware simplifies electronic upgrading in the field.

Each PentaScanner version features a comprehensive library of 200 programmable cable types and is capable of storing up to 500 individual Autotests. With a single key press, you will know if a network will support 10BASE-T, 4/16 Mbps Token Ring, ARCnet, ISDN, AppleTalk, T1/DS1, TP-PMD, CDDI, TPDDI, 100BaseVG, Fast Ethernet (both proposals), ATM51 or ATM155 Mbps. Native language support is provided in English, French, German and Spanish.

The 2-Way Injector+ makes the most advanced cable management tools even more efficient. It give either PentaScanner an extra margin of accuracy, speed and reliability. The level of accuracy is indistinguishable from that of a network analyzer. These complete systems set the standard for LAN cable testing and certification with exceptional performance and stability.

Choose from the PentaScanner 350 with Performance Grading to rank cable and three PentaScanner+ Kit versions. PentaScanner+ with 2-Way Injector+ provides TSB-67 Level II accuracy for two-way channel and basic link testing. The 2-Way Injector measures far-end and near-end crosstalk. Use PentaScanner+ with Super Injector to assure TSB-67 Level II accuracy for one-way channel and basic link testing. The Super Injector performs true one-way attenuation measurement per IEEE/EIA specifications. When Level I accuracy for channel testing is sufficient, use PentaScanner Cable Admin with Super Injector.

Each PentaScanner model has a 9.6-volt rechargeable, replaceable battery pack and a built-in charger for continuous use with the supplied ac adapter. Battery life is 10 hours (six hours in continuous Autotest). Each kit includes free unlimited technical support. Optional Cable Management System (CMS) database software for Windows lets you keep a convenient computerized record of installation and maintenance activities.



PentaScanner Specifications

Display: 128 x 64 graphic LCD with backlight, 2.25" x 1.5" display area

Ports: BNC and shielded RJ-45

Serial Port: DB-9

NEXT: 0.7- to 100-MHz frequency range

Attenuation: 0.512- to 100-MHz frequency range

Wire Map: Use injector for complete mapping of RJ-45 connector wiring

	Range	Accuracy
Length: TDR method to determine length and distance to cable faults		
Twisted Pair:	0-3000 feet	4% or 2 feet, whichever is greater
Coax:	0-4000 feet	4% or 2 feet, whichever is greater
Impedance:	40-200 Ω	$\pm 5 \Omega$ (2- Ω resolution)
Loop Resistance:	0-15 Ω	$\pm 0.3-\Omega$ accuracy
	15-200 Ω	$\pm 2\%$ accuracy
	200-1000 Ω	$\pm 5\%$ accuracy
Capacitance:	0-200 pF	± 20 pF
	200-100,000 pF	$\pm 10\%$





PentaScanner 350 with 2-Way Injector+ Kit

Performance Grading Focuses on Link Quality for High-Speed Applications

- Tests up to 100 MHz on 350-MHz cable
- Tests headroom above standard Category 5 cable
- All PentaScanner+ features plus performance grading

Microtest, the industry leader in cable certification, is at the forefront of technology again with the introduction of the PentaScanner 350. An initiative by top cable manufacturers is underway with the development of high-bandwidth cable able to transmit data up to 350 MHz. This effort is supported by premier suppliers of Category 5 cabling and components such as Belden, Krone, CommScope, Berk-Tek, Thomas & Betts, Bell Global Solutions, Mohawk CDT and others. PentaScanner 350 analyzes the headroom available for future high-speed applications on this high-bandwidth cable.

All Category 5 links are not the same. While some links barely pass, others provide 10 to 50 times better signal-to-noise ratios. To differentiate marginally compliant links from superior performance links, PentaScanner 350 offers Performance Grading on high-band cable. It measures and rates the relative quality of high-performance links by analyzing headroom available for high-speed applications. The higher the attenuation to crosstalk ratio (ACR), the better the performance.

The 350 offers the most accurate measurement system available with 2-Way Injector+ and 350-MHz Performance Grading all in one kit. Accessories are optional. The 110 Adapter Kit for use on 36-pin to 110 blocks includes both 568A and 568B wiring configuration. Use the Unterminated Cable Adapter Kit with 36-pin. This 1.75-pound scanner is 4" x 8" x 2.15". One-year warranty.

800X940 8180-00 PentaScanner 350 w/2-Way Injector+ Kit

REGULAR PRICE\$5750.00 ea.

SPECIAL PRICE\$4785.00 ea.

800X919 8133-03 36-Pin 110 Adapter Kit220.00 ea.

800X916 8132-02 36-Pin Unterminated Cable Adapter Kit75.00 ea.

800X918 8132-01 36-Pin to Mod 8 Patch Cable75.00 ea.

Microtest

PentaScanner+ with 2-Way Injector+ Kit

TSB-67 Level II Accuracy for Two-Way Channel and Basic Link Testing

The premier PentaScanner+ version is ideal for cable contractors, field service providers and LAN administrators required to certify installed Category 5 links to Level II accuracy. It enables testing of both channel and basic link. Use the 2-Way Injector+ to obtain measurements from both ends of a cabling link at the push of a button. This combination provides a level of accuracy in a handheld tool that is indistinguishable from a network analyzer.

Use this top-of-the-line version with updated hardware and software to measure NEXT and ACR from both ends of the link. Upgraded software provides complete TSB-67 Level II compliance. It features quicker Autotest, swept attenuation per TIA requirements, implemented data output to support graphing, "Compas" alphanumeric editing method, battery refresh mode, improved display graph functions, updated cable list and adopted TIA pair designations on screens.

Includes PentaScanner+, 2-Way Injector+, serial cable, two Mod 8 to 36-pin patch cables, Mod 8 adapter, power supply for both scanner and injector, carrying case, offer for free additional Mod 8 adapter and manual. At 1.75 pounds, the scanner is 4" x 8" x 2.15". The full-size two-way injector weighs 1.4 pounds. One-year warranty.

800X913 8130-00 PentaScanner+ with 2-Way Injector+ Kit

REGULAR PRICE\$5495.00 ea.

SPECIAL PRICE\$4585.00 ea.

800X843 8054-02 Cable Management Software for Windows395.00 ea.

800X905 8122-02 Optional 36-Pin to Mod 8 Patch Cable75.00 ea.

800X907 8122-03 Optional Mod 8 Adapter80.00 ea.

800X910 8123-01 Optional 66/110 Punch Down Block245.00 ea.



PentaScanner+ with Super Injector Kit

TSB-67 Level II Accuracy for One-Way Channel and Basic Link Testing

This kit offers a truly cost-effective way to have PentaScanner+ accuracy in a single-ended cable testing kit. It is ideal for the cable contractor, field service provider and LAN administrator required to certify Category 5 links to Level II accuracy. The functionality of the Super Injector version is the same as the PentaScanner+ with 2-Way Injector+ except that it performs testing of the channel and just one end of the link. Bi-directional measurements can be made with the standard Super Injector by swapping ends with the PentaScanner+.

Use the Super Injector version with updated hardware and software to measure near-end-crosstalk (NEXT) and attenuation-to-crosstalk ratio (ACR) from one end of the link. Upgraded software provides complete TSB-67 Level II compliance. It features quicker Autotest, swept attenuation per TIA requirements, implemented data output to support graphing, "Compas" alphanumeric editing method, battery refresh mode, improved display graph functions, updated cable list and adopted TIA pair designations on screens.

This kit includes PentaScanner+, Super Injector, serial cable, Mod 8 to 36-pin patch cable, Mod 8 to Mod 8 patch cable, Mod 8 adapter, carrying case, offer for free additional Mod 8 adapter and manual. The 1.75-pound scanner measures 4" x 8" x 2.15". At 9 ounces, the active remote signal injector and test coordinator measures 3" x 6.5" x 1.3". One-year warranty.

800X925 8150-00 PentaScanner+ with Super Injector Kit

REGULAR PRICE\$4195.00 ea.

SPECIAL PRICE\$3485.00 ea.

800X843 8054-02 Cable Management Software for Windows395.00 ea.



PentaScanner Cable Admin with Super Injector Kit

Level I Accuracy for Channel Testing

The PentaScanner's popularity with LAN administrators prompted the continuation of the original Mod 8 connector version. It is still the best tool for the LAN administrator who may not require the accuracy of Level II to certify the cabling system but performs daily network troubleshooting. The functionality of this version is generally the same as the original PentaScanner with some minor enhancements and options.

Use this LAN manager's model to test the channel portion of the link. It measures NEXT and ACR from one end of the cable. You get the Level I accuracy required for troubleshooting and certifying the channel. An upcoming

free software upgrade will make this version TSB-67 compliant too.

This troubleshooting kit includes PentaScanner Cable Admin, Super Injector, serial cable, two Mod 8 to Mod 8 patch cables, carrying case and manual. Weighing 1.75 pounds, the scanner measures 4" x 8" x 2.15". The 9-ounce active remote signal injector and test coordinator measures 3" x 6.5" x 1.3". One-year warranty.

800X920 8140-00 PentaScanner Cable Admin with Super Injector Kit

REGULAR PRICE\$3350.00 ea.

SPECIAL PRICE\$2785.00 ea.

800X857 8091-01 Super Injector Only545.00 ea.

800X843 8054-02 Cable Management Software for Windows395.00 ea.



NetWare COMPAS™ Handheld LAN Troubleshooter

The New Direction in LAN Diagnostics

The NetWare COMPAS™ is a MICROTEST® network diagnostic tool that combines the best features of protocol analyzers, cable testers, serial communications testers and network diagnostic utilities in one convenient unit. This rugged handheld instrument is completely portable. It incorporates an intuitive interface with a backlit graphical display to simplify troubleshooting your Ethernet network.

Designed for 10-Mbps Ethernet networks with either 10BASE-2 (coaxial) or 10-BASE-T wiring, this tester diagnoses network problems quickly and easily. The NetWare COMPAS is ideal for LAN administrators, technicians and third-party service providers who are faced with solving everyday, common network problems. Discover if servers are okay, why the network is slow, why you can't log in, why connection drops and if cable is okay. This feature-packed unit is easy to use. Just press the DIAGNOSE button, and this troubleshooter will run the necessary tests, identify network problems and present clear solutions in just a few seconds.

Attach it anywhere on your network. Whether attached to a fileserver, workstation or hub, this diagnostic tool will identify the connection and run the appropriate tests. No time-consuming configuration or set-up is required. Because it is completely portable, you can resolve problems quickly at the problem site. It focuses on key problems with your network, eliminating the need to examine the details of every test. The data-sensitive ASSIST key takes the mystery out of problem resolution by explaining test results and suggesting how to resolve network problems.

NetTap™ simplifies connection. This revolutionary feature enables you to insert the NetWare COMPAS conveniently between a fileserver or workstation and the hub and still let network data pass through. While in NetTap mode, you can monitor traffic and errors between any network node and the hub while packets continue to pass through the unit. This ability is especially valuable on networks with newer switched Ethernet hubs. In this mode, you can see data that could not be seen before. Now, balancing network traffic on switched hubs is simple.

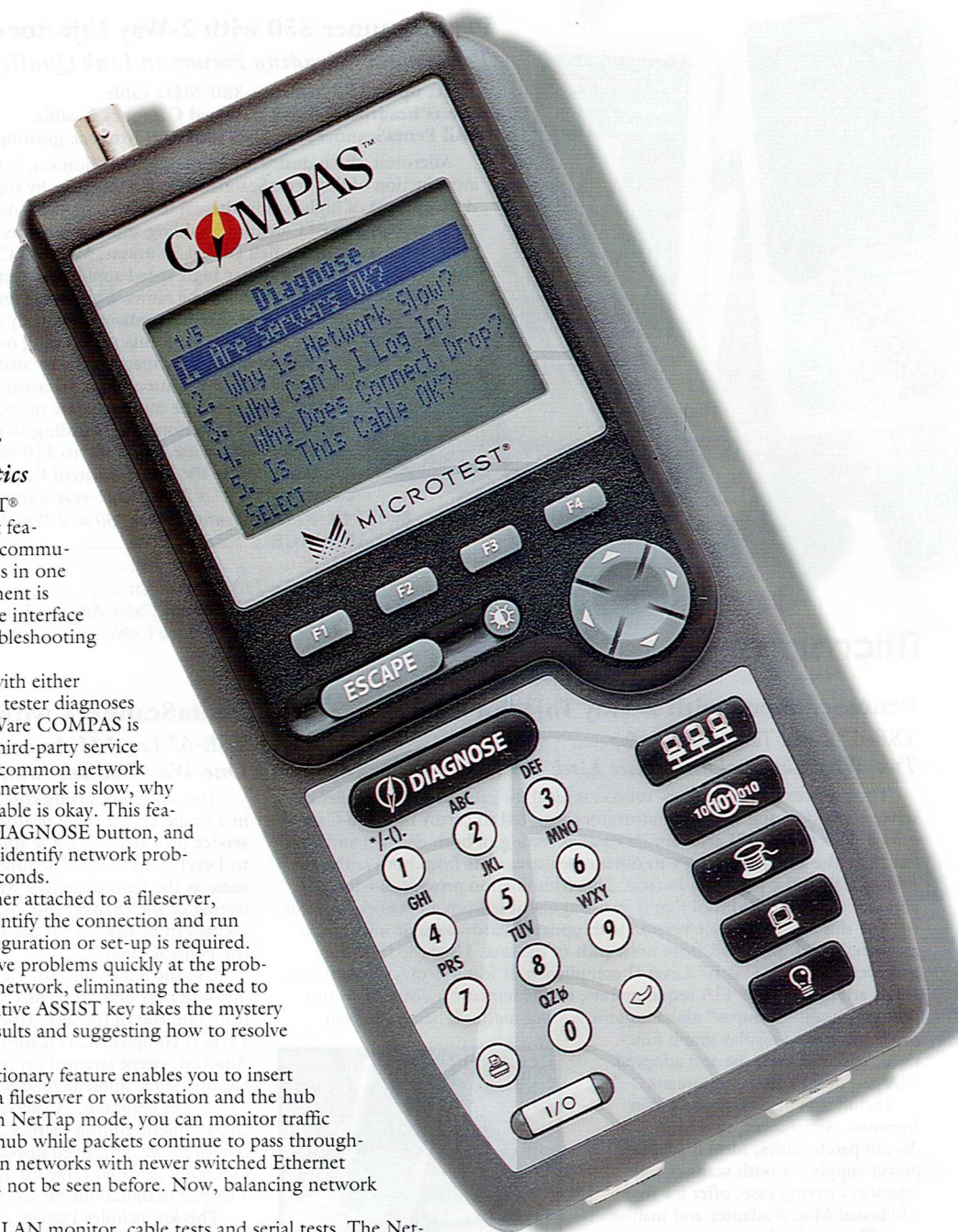
Test suites include diagnose, network tests, LAN monitor, cable tests and serial tests. The NetWare COMPAS provides detailed information about NetWare® file servers. Also use it to diagnose problems inside file servers via its NetWare Loadable Module (NLM). This tester will monitor network traffic as well as assist you with protocol-related problems. It can show you traffic and error levels on your network plus identify top talkers and the mix of protocols in use.

Cabling problems are often the source of network faults and can be difficult to detect. The NetWare COMPAS can verify the integrity of your Ethernet cable and troubleshoot problems when they occur. Use it to test cable for length, crosstalk, noise, signal level and proper connector wiring. With its two RJ-45 jacks, this instrument even tests patch and drop cables, the most likely failure points for networks. Remote PC connections to the network are becoming more popular. Functions are included to assist you with serial link troubleshooting. Use the serial testing function to monitor serial conversations, determine throughput and identify workstations' maximum receive rate.

The NetWare COMPAS user interface features a 128 x 64 graphic LCD with backlight that works even in dark wiring closets, elastomeric keypad with dedicated major function keys, time of day clock and audio tone for alarm functions. Connections include IEEE 8023 Ethernet-compatible BNC and two 10BASE-T Ethernet-compatible RJ-45 jacks with automatic selection. Recognized protocols include ARP, XNS, VINES, DECnet, LAT, AppleTalk I, AppleTalk II and ISO. Screen print support includes HP PCL and Epson. Printer test support includes PostScript, HP PCL, ASCII Text and Epson. The NetWare COMPAS prints to serial port or network queue.

This handheld LAN troubleshooter comes complete with NetWare Loadable Module (NLM), far-end adapter for testing UTP wiring (wire map), RJ-45 patch cable, ac adapter, custom carrying case and user's guide. The 1.75-pound compact unit measures 4" x 8" x 2.15". One-year warranty.

800X930 8160-00 NetWare Compas™ (Regular Price)\$3595.00 ea.
SPECIAL PRICE\$2985.00 ea.



NetWare COMPAS™ Features

- Combines best features of protocol analyzers, cable testers, network diagnostic utilities and serial communications testers
- Hand-held and completely portable network diagnostic tool
- Combines intuitive interface with backlit graphical display to make troubleshooting your Ethernet network easier than ever before
- Focuses on key network problems, eliminating the need to examine the details of every test
- NetTap™ feature enables insertion between file-server or workstation and hub
- Flash program memory allows field upgrading via serial port
- Includes NetWare Loadable Module



Microtest

LAN Maintenance Kit

The Complete Certification and Troubleshooting Combination

- Heavyweight performance in lightweight, handheld tools
- Save innumerable hours as two-instrument kit saves you money
- Complete LAN solution includes PentaScanner+ and COMPAS

Now you can solve LAN maintenance problems with a winning combination from Microtest. The industry leader's complete LAN maintenance solution is a two-piece set of useful network tools. This convenient kit includes the PentaScanner+ Category 5 Cable Tester and the COMPAS™ LAN Diagnostic Tool. They are packaged together in the LAN Maintenance Kit at tremendous savings over buying each instrument separately. You get heavyweight performance in lightweight, handheld tools. Save innumerable hours as you save money.

For reliable, efficient Category 5 cable testing, certification and maintenance, the PentaScanner+ is unrivaled. Designed to troubleshoot network cabling problems and eliminate costly rewiring, it certifies 155 Mbps ATM and far exceeds the TIA/EIA TSB-67 Level II accuracy requirements for one-way channel and basic link testing.

The PentaScanner+ is ideal for the cable contractor, field service provider and LAN administrator required to certify and maintain Category 5 links. Certify 200 cable types to Level II accuracy and store up to 500 autotests. Use it to test the channel and one end of the link. Bi-directional measurements can be made with the Super Injector+ by swapping ends with the PentaScanner+. Features user-selectable cable grading performance to EIA-568A Category.

Measure near-end-crosstalk (NEXT) and attenuation-to-crosstalk ratio (ACR) from one end of the link. Features include quick Autotest, swept attenuation per TIA requirements, implemented data output to support graphing, "Compas" alphanumeric editing method, battery refresh mode, display graph functions, updated cable list and adopted TIA pair designations on screens.

As the ultimate network troubleshooter, the COMPAS offers the best features of protocol analyzers, cable testers and serial communications testers as well as network diagnostic utilities in one simple-to-use tool. Use it to solve everyday common cabling, network and NetWare server problems. From traffic errors to downed servers, the COMPAS solves network problems quickly and easily. It is designed for 10-Mbps Ethernet networks with 10BASE-2 (coaxial) or 10BASE-T wiring. This rugged tool is truly handheld for portable field use to work the way network managers do — on the run. It taps in anywhere.

Network diagnostic utilities include NetWare® and TCP/IP for Internet troubleshooting capabilities. This gives users the ability to seek out common problems encountered when connecting to the Internet and simplifies trou-



bleshooting in local TCP/IP environments. COMPAS features include duplicate IP address detection, IP ring, IP host summary list and detail, IP local segment information and Internet control message protocol (ICMP) monitoring. Includes trace route and domain name services (DNS). It displays a list of IP routers through which the packets passed on the way to the destination. The Trace Route Detail screen displays the average round trip time between each router and COMPAS.

Ergonomic design features include integrated clock, backlit 128x64 graphic display that works even in dark wiring closets, uncluttered displays, extensive use of icons to represent key elements (hubs, cable, etc.), one-button printing to NetWare queues and serial printers plus Flash memory for easy firmware updates.

These two Microtest tools are described individually in greater detail on the previous pages. The LAN Maintenance Kit includes the PentaScanner+ with Super Injector+ and the COMPAS with NetWare loadable module (NLM) and TCP/IP utilities.

Accessories completing this kit are serial cable, two power supplies, two 36-pin to Mod 8 patch cables, two Mod 8 adapters, one Mod 8 to Mod 8 patch cable, two far-end adapters, large carrying case and user documentation.

The 1.75-pound PentaScanner+ measures 4" x 8" x 2.15". At 9 ounces, the active remote signal injector and test coordinator is 3" x 6.5" x 1.3". The 1.75-pound COMPAS measures 4" x 8" x 2.15". One-year warranty.

800X935 8170-00 LAN Maintenance Kit (Regular Price)\$7435.00 ea.
SPECIAL PRICE\$6185.00 ea.



Microtest

3990-20 Coax Interface Adapter Kit

Model 3990-20 kit includes RG-59 male to male adapter cable, BNC male to male adapter, N-Series adapter, BNC female to male adapter, BNC female to female adapter, coax to twisted-pair adapter, "T" adapter, token ring to BNC adapter and user guide. *Works with PT, 310 and 350.*

800X685 3990-20 Coax Interface Kit...1-5, \$300.00 ea.; 6-up, \$279.00 ea.

8051-10 Cable Tracer II

The Tracer II works with a Microtest Scanner to help you locate any coaxial or twisted-pair cables hidden in walls, ceilings, floors and patch panels. This improved version of the original Tracer includes antenna and ground cables.

Works with 310 and 350.

800X640 8051-10 Cable Tracer II.....1-5, \$220.00 ea.; 6-up, \$205.00 ea.

8051-12 Telco Adapter Kit

Inclusive kit tests twisted-pair wiring. Includes two unterminated cable adapters, RJ-45 female to female coupler, two RJ-45 to RJ-11 cables, 100-Ω and 120-Ω terminating plugs, shorting plug, 66/110 adapters, connecting cable and user guide. *Works with PT, 310 and 350.*

800X820 8051-12 Telco Adapter Kit...1-5, \$245.00 ea.; 6-up, \$228.00 ea.

CMS Database Software

Cable Management System database provides a computerized record of installation and maintenance activity. Choose from two versions. The 8054-02 for Windows includes disk, reference guide and 3.5" disks. *Works with PT and 350.* Use the 8051-08 for DOS on IBM PC and compatible (5.25" and 3.5" disks). It includes disk and reference guide. *Works with 350.*

800X843 8054-02 Software.....1-5, \$395.00 ea.; 6-up, \$367.00 ea.

800X825 8051-08 Software.....1-5, 295.00 ea.; 6-up, 274.00 ea.

Other Microtest Accessories

Compatibility Key

PT: PentaScanner
310: MT310
350: MT350

Stock No.	Part No.	Name	Description	Works with	Price
800X314	3570-03	Coax Twisted-Pair Adapter	Connects coax or unterminated twisted-pair wiring to Scanner's BNC.	PT, 310, 350	\$ 35.00 ea.
800X318	3570-05	N-Series Adapter	Thick to thin Ethernet adapter.	PT, 310, 350	25.00 ea.
800X316	3570-04	Twinax Adapter	Connects twinax data connector to Scanner's BNC.	PT, 310, 350	45.00 ea.
800X821	8051-05	Token Ring Adapter	Lets Scanner break into closed cable loop inside IBM data connector.	PT, 310, 350	175.00 ea.
800X823	8051-06	Unterminated Cable Adapter	Tests wire pairs on punch-down blocks or any other twisted-pair wire without connector at end.	PT, 310, 350	45.00 ea.
800X824	8051-13	66/110 Punch-Down Block Adapter Kit	Plug 66 and 110 Telco adapters directly to four pairs on punch-down blocks. Includes adapter cable and user guide.	PT, 310, 350	185.00 ea.
800X783	8002-08	DB-9M/DB-9F Serial Cable	6-foot cable connects Scanner to PC.	PT, 310, 350	10.00 ea.
800X784	8002-09	DB-9M/DB-25M Serial Cable	6-foot cable connects Scanner to serial printer.	PT, 310, 350	20.00 ea.
800X832	8122-01	Large Nylon Carrying Case	Multi-pocket case houses Scanner, Tracer II, ac adapter, miscellaneous components and manual.	310, 350	75.00 ea.
800X330	8052-03	Compact Canvas Carrying Case	Houses Scanner, Tracer and various adapters but not manual.	310, 350	39.00 ea.
800X618	3910-10	RJ-45 F-F Coupler	Connects RJ-45 to RJ-45.	PT, 310, 350	25.00 ea.
800X858	8092-02	RJ-45 F-F Shielded Coupler	Supports shield connection.	PT	25.00 ea.
800X670	3980-10	RJ-45 Breakout Box	Set up twisted-pair circuits without removing RJ-45 connectors.	PT, 310, 350	125.00 ea.
800X665	3985-00	Transceiver Monitor	Provides diagnostic capabilities for thick Ethernet and 802.3 networks.	PT, 350	245.00 ea.





LANcat Test Functions and Features

Autotest: Automatically provides C of C to EIA, TIA or IEEE applicable specifications. Performs the following tests: Background noise, wire map, NEXT, attenuation, cable length, characteristic impedance (40-180 Ω) and terminator resistance (40-120 Ω), reporting up to three impedance anomalies.

Noise: Counts idle channel impulse noise.

Traffic: Continuously displays Ethernet utilization percentage (time active/total time).

Test Storage: Stores up to 500 test results for Model 1800 (50 for Model 1500) or a traffic monitoring report for external printing. Results can be given a four-digit alpha-numeric code for easy identification.

Standard Cable: Select from coax plus shielded or unshielded twisted-pair cable for Model 1800. Use Model 1500 for coax and unshielded twisted-pair cable only.

Custom Cable: Allows definition of connector types and NVP for up to two cables for Model 1800 (up to four cables for Model 1500).

Special Setup: Selects length (meters or feet), background noise and impedance mismatch.

Self Test: Tests for correct operation and calibration.

Length: Computes 20- to 4000-foot cable length for coax and 20- to 2000-foot length for UTP. Model 68 also computes 20- to 2000-foot length for STP.

Wire Map: Tests UTP cable for proper termination, connection and polarity.

Oscilloscope Mode: Places the unit in repetitive mode to enable use of oscilloscope for TDR response scaling (Model 1800 only).



Datacom Technologies

LANcat LAN Cable and Activity Testers Cable Certification Tools

- Automatic certification of LAN wiring per EIA/TIA-568, IEEE-802.3 and IEEE-802-5
- TDR function, near-end crosstalk and attenuation to 20 MHz for Model 1800 (10 MHz for Model 1500)
- Store up to 500 cable test results for Model 1800 (50 for Model 1500) for external printing
- Traffic monitoring on 10BASE-T or Thinnet Ethernet networks

Each LANcat is a hand-held, high-quality LAN cable tester with all the necessary functions for cable certification and fault location. Whether installing, expanding or troubleshooting, these easy-to-use devices are cost effective and ensure proper LAN installation and operation. Choose from two models. The top-of-the-line LANcat 1800 performs complete cable certification. Use the 1500, our most popular cable tester, for unshielded twisted pair and coax.

Designed for easy operation by cable installers and LAN managers, LANcat testers feature four tactile-feedback switches and a 10-position rotary function selector. Quickly select the desired function to provide full certification of coax, shielded twisted-pair (Model 1800 only) or unshielded twisted-pair cable with one easy turn of the dial. This eliminates the confusion of multi-level menus and endless key punching.

Use these battery-powered instruments to test and report cabling conditions quickly.

They measure near-end crosstalk (NEXT), attenuation, noise if it poses a problem for network operation and cable length, noting three cable faults. Both models count idle channel impulse noise above the user-selectable threshold. Traffic monitoring is easy. Each LANcat tester continuously displays percent utilization, providing audio feedback from network traffic. An active bar graph shows percent utilization. Oscilloscope mode (available in Model 1800 only) provides for TDR response scaling. Test results may be displayed on the four-line, 16-character LCD or transmitted to a printer for hard-copy certification of LAN cabling.

These portable testers have 10-hour typical battery life and low-battery indicators. Each comes complete with a remote unit, ac adapter, two RJ45 patch cables, two RJ45 clip lead cables, two RJ45 m-f strain relief cables, BNC tee connector, 50- Ω BNC to BNC cable, 50- Ω BNC terminator and DB9 to DB25 printer cable. Also includes five 9-volt alkaline batteries (two with unit and three spare), carrying case and manual. Each unit measures 1.7" x 4" x 7.6" and weighs 1.25 pounds. One-year warranty.

415X673 LANcat 1800 Tester.....1-2, \$2190.00 ea.; 3-up, \$1975.00 ea.

415X650 LANcat 1500 Tester.....1-2, 1590.00 ea.; 3-up, 1435.00 ea

LANcat Hardware Features

Network Connectors: Both RJ45 and BNC

Non-Volatile Memory: Lithium battery-backed CMOS memory provides storage of last setup, two cable types, up to 500 test results (50 for Model 1500) and one traffic monitoring report

Printer Interface: RS232, DB9 female connector

Input Protection: Normal telco loop, ringing and transient voltages

Display: Four lines x 16-character LCD

Keys: On/off, two cable selectors and a save tactile feedback switch

Function Select: 10-position rotary

Power: Two 9-volt alkaline batteries

Battery Save: Automatically powers down and saves results if five minutes of inactivity occur





Model 650 LAN Cable Meter

Rapid Diagnosis and Certification

- For coax and UTP cable in Ethernet and Token Ring networks
- Wire Map detects both correct and faulty wiring
- Built-in TDR finds cable length and distance to fault
- NVP calibration to user cables for improved length accuracy
- Measures termination and characteristic impedance
- Measures NEXT and attenuation plus detects split pairs
- Bar Graph indicates Ethernet traffic activity on live network

The Fluke 650 LAN CableMeter offers the right combination of performance, features and ease of use for rapid problem diagnosis and certification of LAN cables. It is ideal for cable installers, LAN maintainers and managers who work with both unshielded twisted-pair and coaxial cables used in Ethernet, Token Ring and many other networks. Portable hand-held operation allows convenient remote testing.

With a simple twist of a knob and self-prompting alphanumeric display, operation is straightforward and intuitive. The 650 provides multifunction versatility. A wide range of capabilities helps pinpoint faults such as opens, shorts, crossed pairs, split pairs and reversed connections. Measure attenuation (0-40 dB), termination and characteristic impedance. Built-in TDR finds cable length and distance to fault. NVP calibration to user cables provides improved length accuracy.

Model 650 Cable Types

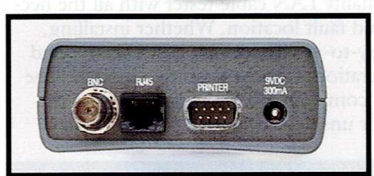
UTP: 10BASE-T and IBM Type 3, Levels 3, 4 and 5
Coax: 10BASE-2, RG58, RG59 and RG62
Custom: two user-definable options built in

Wire Map detects correct and faulty wiring. The 650 provides time-stamped noise monitoring, detects Ethernet traffic activity plus identifies collisions and jabber. Measure NEXT (0-40 dB, 5-10 MHz in 100-kHz steps) with ± 2 -dB accuracy.

Isolating specific cable problems is a snap. A sharp 64-character, four-line LCD clearly pinpoints the nature of the problem and its exact location. Twist the knob to Autotest to run a series of cable tests and compare results to industry cable standards. Display indicates pass or fail plus other important parameters. Up to 50 Autotest results can be stored and printed later. Provide proof that cables are installed properly by printing a certification report via serial printer port.

Power is supplied by replaceable 9-V alkaline batteries or 120-V ac line adapter with automatic power shutdown. Includes remote unit, two RJ-45 patch cables, RJ-45 clip lead cable, two RJ-45 couplers, 50- Ω BNC cable, ac line adapter, two spare 9-V batteries and manual. Included soft vinyl carrying case has a compartment for accessories, patch cables and tools. The 1.3-pound CableMeter is 1.7" x 4" x 7.6". One-year warranty.

045X200 Model 650 LAN CableMeter1-2, \$1990.00 ea.; 3-up, \$1899.00 ea.



652 LAN CableMeter

Fluke's Ultimate LAN Cable Troubleshooting Tool

- For coaxial, STP or UTP cable in Ethernet or Token Ring networks
- Tests cable per EIA/TIA 568 and IEEE-802 cable specifications
- Performs fault location and full cable verification
- Printed reports document cable certification tests and traffic activity

Fluke's 652 is one of the most comprehensive LAN cable testing, verification and certification tools on the market today. It is battery operated to go anywhere cable installers, LAN maintainers and LAN managers do. This indispensable, constant companion stores a full day's worth of results. It tests cable per EIA/TIA 568 and IEEE-802 specifications, verifies cable performance per LAN specifications and prints certification reports. Use it with 10BASE-T or coaxial Ethernet, UTP or STP Token Ring and coaxial ARCnet.

Model 652 provides a complete suite of tests: wire mapping, length, noise, NEXT, split pair identification, attenuation, characteristic and termination impedance plus Ethernet traffic measurements. It determines cable faults 20 feet or more from unit and features audible pass/fail beeper. Select 11 functions with simple rotary switch. A 16-character by four-line alphanumeric LCD can be backlit for easy reading in dim light. Bar graph shows traffic activity at a glance.

Define connector type, characteristic impedance and NVP for specific cable. Connect oscilloscope to cable for detailed analysis of TDR scan pulses and reflections. Up to 500 autotest measurements and one traffic measurement can be stored in non-volatile memory and printed via RS-232 serial port.

Model 652 Cable Types

UTP: 10BASE-T-3, 4, 5; UTP Token Ring-3, 4, 5; IBM Type 1
Coax: RG58 Foam, 10BASE-2, RG59, RG59 Foam, RG62, 10BASE-5
Custom: two user-definable options built in

Model 652 Specifications

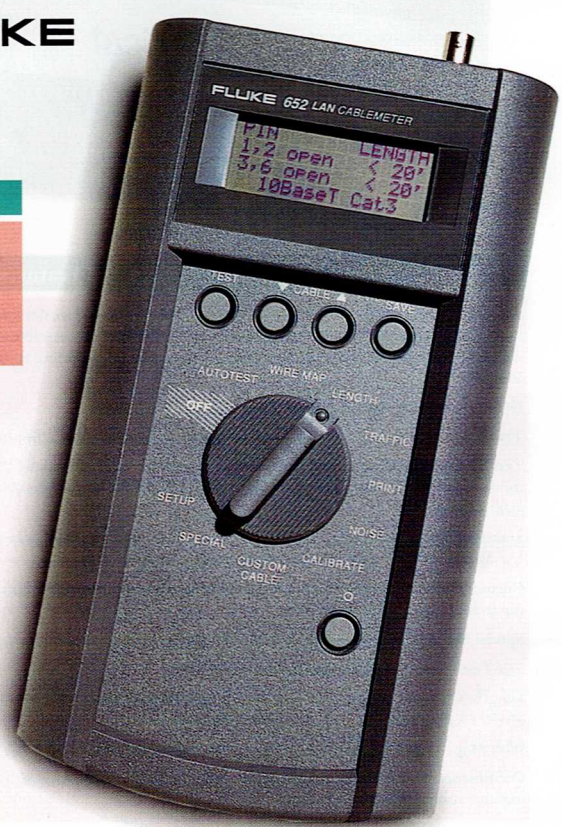
TP Cable Length Range: 20-2000 ft.
Coax Cable Length Range: 20-4000 ft.
Accuracy: $\pm 1\%$ reading + 2 ft.
Resolution: 2 ft.
Connectors: Input — RJ45 and BNC;
Output — RS-232C serial printer port

The 652 Meter uses six AA alkaline batteries; the 650R Remote uses a 9-V alkaline battery for eight hours of continuous operation. Automatic power down occurs after 15 minutes of non-use.

Includes N6520 Cable Kit, ac line adapter, RS-232 printer cable (DB9 to DB 25), soft case and user's manual. The 1.7-pound 652 is 9.2" x 5" x 1.9". The 5.5-ounce remote is 3.75" x 2.9" x 1.4". One-year warranty.

652 CableMeter
045X2021-2, \$2490.00 ea.; 3-up, \$2399.00 ea.

FLUKE



620 LAN CableMeter

Detect Cable Failure from One End

Fluke's new 620 LAN CableMeter is a battery-operated, hand-held instrument that identifies cables failures, measures length of twisted pair (TP) and coax and checks wiring in unshielded twisted pair (UTP), shielded twisted pair (STP), foil-screened unshielded twisted pair (FTP) and coax. Test-as-you-go philosophy reduces service time by allowing one person to detect most cable failures from only one end of cable.

The 620 includes all functions to verify proper installation. Stored cable library provides quick access to common cable types. Access or customize cable characteristics in setup mode. Test function indicates pass or fail for incorrect pairing (split pairs), miswires, shorted and open pairs on all twisted-pair cables as well as shorts on coax. Length measures coax and each pair of TP in feet or meters, testing for anomalies. Wire Map detects and displays wiring connection, shorts, opens and split pairs.

Features two-line by 16-character LCD with five display languages, optional backlit display, four-position rotary switch and five tactile-feedback momentary switches. Includes low-battery and replace-battery indications plus battery save mode. Audible tone signals different operational conditions and can be disabled for pass and fail conditions. Single short tone indicates pass. Three short tones signal test failure of individual wires not pairs. Long tone sounds when invalid key is pressed. Continuous varying pitch signals when 620 should be disconnected from active cable.

Connect cable under test to appropriate connector on top of CableMeter, select proper cable type, category and size before testing or measuring. You may need to calibrate the 620 to cable under test. Cable ID Unit detects far-end wiring failures and identifies cables between room and wiring closet. The 620 displays test results in relation to individual pin numbers.

Powered by two 50-hour AA 1.5-V alkaline batteries. Includes 48" RJ45-RJ45 straight-through patch cable, RJ45-RJ45 female coupler, cable identifier #1, softcase, quick reference card and manual. The 12.5-ounce meter is 7.25" x 3.9" x 1.8". One-year warranty.

Model 620 Specifications

Measurement	Distance	Accuracy
Length	1-999 feet	7%
Shorts	1-999 feet	5% (Coax 10%)
Opens	1-999 feet	10%
Split Pairs	6-999 feet	Split Pair must be >30%

620 LAN CableMeter

045X197 1-2, \$789.00 ea.; 3-up, \$749.00 ea.

RingOut™ Cable Tester

The Most Complete Token Ring Cable Tester

- Quickly determines the usability of cables
- Indicates individual cable conductor faults
- Indicates state of MAU port to identify "stuck-open/stuck-closed" conditions
- Aids in locating beaconing network station
- Enters active rings transparently
- Confirms physical connections of inactive networks

RingOut™ from Bytex is a hand-held cable testing and network troubleshooting tool for 4- and 16-Mbps IEEE 802.5 Token Ring networks. It is an indispensable tester for network installers and technicians seeking to resolve Token Ring network interconnection problems. Versatile and easy to use, it increases network reliability and reduces network downtime.

Tests conclusively confirm cable and MSAU port usability as well as verify inactive network operation. They fall into four groups: cable, ring, dc continuity and signal degradation. Cable Test performs a loopback operation on a cable and checks the MSAU port relay. Ring Tests (Insertion and Send) determine if ring can be entered and if Token Ring signals transmitted over the network by RingOut on inactive networks are returned to the tester in tact. DC Continuity Test looks for such cable faults as shorts, swaps and breaks. Signal Degradation Test connects an oscilloscope to RingOut's oscilloscope connectors. The tester receives the resulting signal from active networks for further analyzing to identify the cause of signal degradation problems.

RingOut's design is not an adaptation of technology developed for Ethernet, and its capabilities exceed a simple TDR test. Cables may pass a TDR test but still be unable to carry a Token Ring frame at the proper frequency.

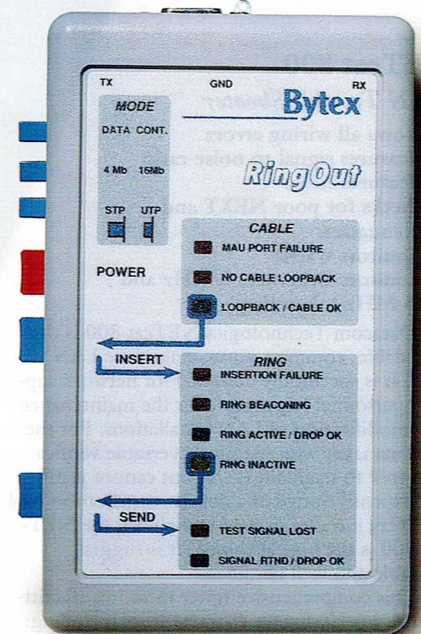


Common Token Ring cable faults caused by improperly installed connectors that can make TDR test results inconclusive are easily detected. RingOut generates, transmits, receives and decodes true IEEE 802.5 Token Ring signals to detect and isolate high-frequency cable faults which may pass low-frequency and direct current continuity tests commonly used. Test results conclusively determine if cable, MSAU port and ring network will work under actual operating conditions. Token Ring network technicians and installers may find these test results more useful than those from other hand-held tools.

RingOut's network monitoring capabilities include beacon detection so a network user can locate and repair the network fault by unplugging cables from an MSAU until the tester indicates that beaconing has ceased. It is indispensable for resolving Token Ring network interconnection problems. RingOut enters active networks transparently and distinguishes between normal network traffic and beacons (Token Ring distress signals). This ability to monitor an active network transparently, detect beaconing and help identify signal degradation problems sets RingOut apart from other testing tools. Additional useful features include built-in DB-9 and RJ-45 connectors, on-board oscilloscope inter-



Bytex



face and a specially-designed front label to help guide users easily through the tests.

Rechargeable ni-cad batteries have a capacity of 12 hours continuous operation when testing continuity and 1.25 hours when testing data. Includes main cable tester, continuity tester, two DB-9 to MIC adapter cables, ac adapter, carrying case and user's manual. No other accessories to buy! The 1-pound unit is 6.3" x 3.7" x 1.5".

810X100 RingOut Cable Tester
1-2, \$1490.00 ea.
3-up, 1399.00 ea.



- Continuity, Opens, Shorts, Reverses, Miswires, Crossed Pairs, Split Pairs
- 10BASE-T Hub Activation
- Ethernet Activity Testing
- Detects Noise
- Monitors Traffic
- Finds Cable Length



NETcat 800

LAN Trouble Shooter

- Shows all wiring errors
- Measures signal to noise ratio
- Measures noise
- Checks for poor NEXT and attenuation
- Monitors traffic
- Monitors Ethernet, 4-MHz and 16-MHz token ring

Datacom Technologies NETcat 800 is the affordable, common-sense, diagnostic LAN tool. It is specifically designed for network support personnel responsible for the maintenance and modification of LAN installations. For the MIS manager who requires a versatile verification tool to maintain LANs but cannot justify the expensive price of a deluxe, certification tool for every installer or field technician, the NETcat 800 is the logical choice. It is rugged, portable and well designed.

This comprehensive tester measures all critical LAN performance characteristics including: length via TDR, NEXT, attenuation, signal-to-noise ratio, impulse and background noise and Ethernet traffic. The NETcat 800 reduces downtime and simplifies trouble shooting. Measured results are compared against applicable IEEE.802

NETcat 800 Specifications

Interface:	RJ45 and BNC
Type of Cables Tested:	UTP, STP, Coax
Range:	20-4000 ft. Coax 20-2000 UTP
Near-End Crosstalk:	5 to 16 MHz
Attenuation:	5 to 16 MHz
Battery Life:	Eight hours typical use
Type of Display:	Four lines x 16 character LCD

are provided by a simple PASS/FAIL indication, so even non-technical service personnel can test and maintain LAN installations.

Other features that distinguish the NETcat 800 are Autotest and Special Functions. When testing twisted-pair cables in Autotest, the NETcat 800 checks background noise, wire map, NEXT, attenuation, length anomalies and characteristic impedance. If any of the test results exceed IEEE.802 LAN specifications, the NETcat 800 displays an intermediate FAIL screen that specifies which test the cable failed. For coax cable, the unit performs the same series of

tests and displays the same screens with the exception of NEXT and attenuation. Under Special Functions the user can choose three different functions.

Custom setup allows the user to change units of length, fault threshold or noise threshold and turn the audible tone on or off. Reset to default resets the NETcat 800 to factory default values. Selftest verifies proper operation of the NETcat 800. The test mode is quickly selected by a seven position, twist and select rotary switch, augmented by four push-buttons. Results are clearly displayed on a four-line, 16-character display.

Dependable and trouble free, the NETcat 800 requires only two common 9-V alkaline batteries which provide up to 10 hours of typical use. The unit automatically powers down after five minutes of inactivity. Accessories include the remote unit for 10BASE-T, a 24" RJ45 cable and an operator's manual. The NETcat 800 weighs 1.13 pounds and is 1.7" x 4" x 7.6". One-year limited warranty.

NETcat 800 LAN Cable Tester

415X680 ...1-2, \$890.00 ea.; 3-up, \$799.00 ea.





NETcat 2000 Series Ethernet Network Testers

- Combination LAN analyzer and physical layer testers
- Handheld portability with Windows GUI ease of use
- Quickly and easily identify common network problems
- Test cable per EIA/TIA 568 and IEEE 802 specifications

Diagnose and manage 10BASE-T and coaxial Ethernet LANs with Datacom's NETcat 2000 Series of powerful handheld analyzers. NETcat 2100 and 2200 combine cable testing, network device testing, network monitoring, protocol analysis and diagnostic functions to troubleshoot the most common LAN problems quickly and easily. WINcat Diagnostic and Control Software operating under Windows 3.1 or 95 provides an intuitive user interface to simplify selecting tests and saving results. On-line context-sensitive help supplies directions on test selection, set up and interpretation.

Quickly resolve some of the most common and frustrating network problems including server log-in failures without the complexity of filter settings. On NetWare systems (2.15 to 4.1), monitor the packet exchange between a station and file server during log-in attempt to determine connection failure cause. Emulate file server or workstation for pre-network-connection testing. Two RJ-45 type jacks allow for connection in series between workstation or file server and hub. Help load balance network traffic across multiple segments. Save up to 24 hours of information. All common protocols are supported. Routing of IPX traffic on the segment is monitored.

Choose from two NETcat 2000 Series models. Add optional TCP/IP Analyzer Software to perform additional IP network tests. Each model includes two RJ-45 jacks for 10BASE-T testing, BNC connector for Thinnet Ethernet testing, serial port with nine-pin micro-D connector and ac adapter connector. User interface is a 128 x 64 graphic LCD. Each 2.1-pound main unit is 10" x 4" x 2.5". One-year warranty.



NETcat 2100

Basic Model

Perform cable tests on up to four-pair UTP cable. Identify most common wiring errors like reversed pairs, crossed pairs, opens and shorts. Includes handheld unit, WINcat software, non-powered remote, Cat 5 patch cable, eight 16-hour AA alkaline batteries, ac adapter, PC interface cable and manual.

54629 NETcat 2100

415X6711-2, \$1790.00 ea.; 3-up, \$1615.00 ea.

54666 Optional TCP/IP Analyzer Software

415X908\$495.00 ea.

54459 Optional NiMH Rechargeable Battery Pack

415X892\$160.00 ea.

NETcat 2000 Series Specification Comparison

	NETcat 2100	NETcat 2200	TCP/IP
Backlit Display	No	Yes	N/A
Cable Tests	TP	TP, coax	N/A
Wiremap	10BASE-T	Four pair + shield	N/A
Impulse Noise	No	Yes	N/A
Background Noise	No	Yes	N/A
Length	No	Yes	N/A
Impedance Anomalies	No	Yes	N/A
Impedance	No	Yes	N/A
Termination Resistance	No	Yes	N/A
NEXT	No	20 MHz	N/A
Attenuation	No	20 MHz	N/A
ACR	No	Yes	N/A
Customized Tests	No	Yes	N/A
Protocols Supported	IPX/IP/Vines/DECNET/Appletalk	IP	
NIC Tests			
MAC Address	No	Yes	N/A
FCS Error Detect	No	Yes	N/A
Output Voltage	No	Yes	N/A
Receiver Sensitivity	No	Yes	N/A
Packet Error Rate	No	Yes	N/A
IP Tests			
Top IP Senders	No	No	Yes
Top IP Receivers	No	No	Yes
IP Station List	No	No	Yes
IP PING	No	No	Yes
IP Name/Addr Resolve	No	No	Yes

NETcat 2200

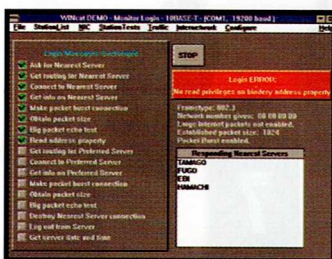
Thorough Network Analyzer Complete with Accessories

NETcat 2200 is the first handheld LAN analyzer to perform a thorough test of workstation and hub NIC interfaces for failed or marginal operation. Both transmitter and receive functions are tested for proper operation per 802.3 specifications. Test hubs (shared and switched), bridges and repeaters with Packet Error Rate Test. This is the first handheld LAN analyzer to provide complete testing of UTP and coax cable for conformance to EIA/TIA and Ethernet cable specifications. Cable Autotest performs a pre-programmed suite of tests that checks all critical parameters and looks for signs of cable damage. Save up to 500 Autotest reports for later output to a printer or PC at up to 19.2 kbps. Customize Autotest sequences with WINcat and create up to five customized cable types.

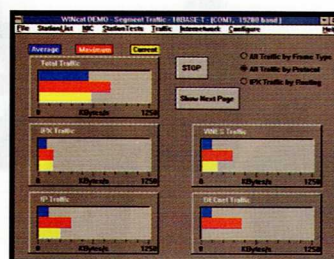
Charge battery pack in the unit while operating or off line. Or use eight AA cells (not supplied). Includes handheld unit with backlit LCD, WINcat software, removable rechargeable eight-hour NiMH battery pack, ac adapter/battery charger, remote unit with 9-V battery, Thinnet adapter, Cat 5 patch cable, PC interface cable, hard-plastic carrying case and manual.

415X692 54627 NETcat 2200 Kit ..1-2, \$2990.00 ea.; 3-up, \$2695.00 ea.

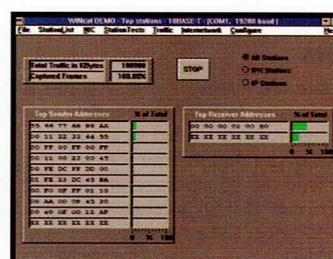
415X908 54666 Optional TCP/IP Analyzer Software\$495.00 ea.



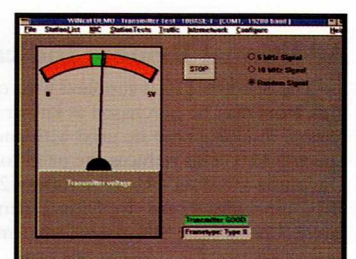
Monitor Login Test



Segment Traffic Test



Top Stations Test



Transmitter Test



Spectris 110 Features

- 10BASE-T Cabling
- Tests All Four Pairs
- RJ45 Input
- One-Button Operation
- Tests Eight Remotes Simultaneously
- Wire Mapping
- One-Person Operation
- Low Price \$249.95

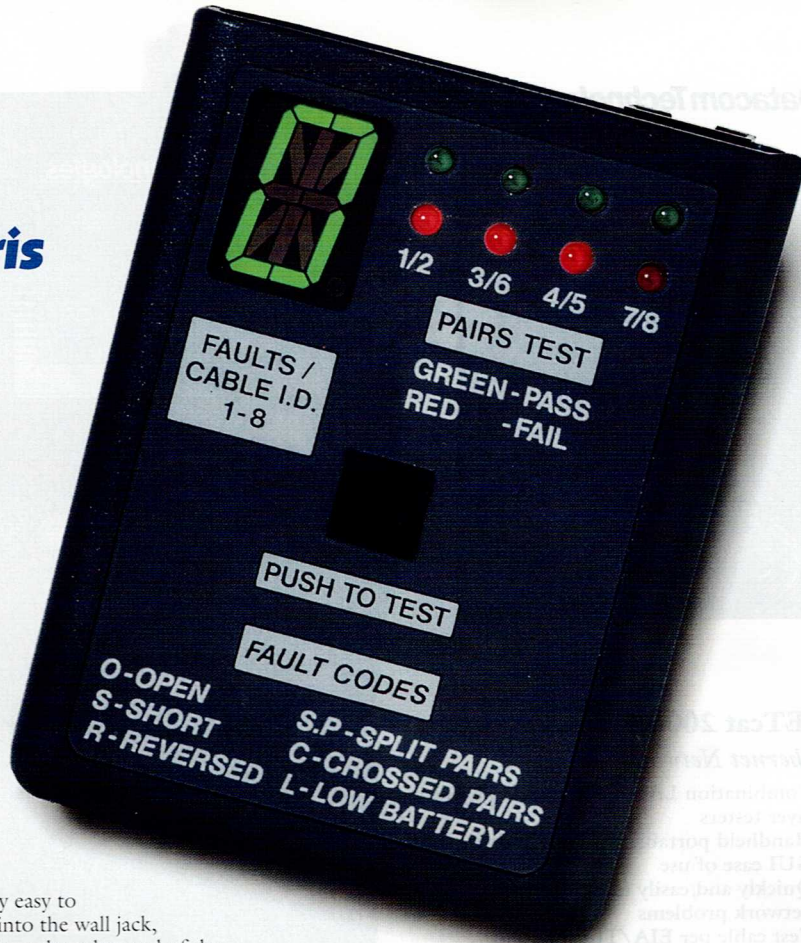
Spectris 110 10BASE-T Wiring Fault Tester

Works with up to Eight Remote Identifiers

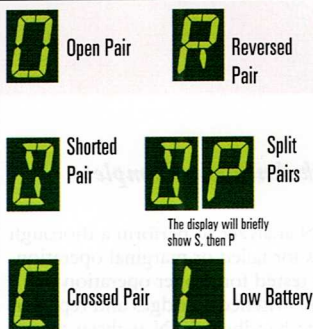
- Identifies open, shorted, crossed, reversed and split pair faults
- Performs cable identification and verification

Our new Spectris 110 is an effective and simple-to-use instrument for testing all the various faults found in 10BASE-T cabling. It identifies faulty wiring as open, shorted, crossed, reversed and split pairs. A large, single-digit, 16-segment LED flashes the fault codes. Four red LEDs indicate which cables are wired incorrectly; four green LEDs indicate correct wiring. In addition to fault finding, Spectris 110 also can verify or identify up to eight individual cables.

spectris



Identifier Chart



This tester is extremely easy to use. Insert a remote unit into the wall jack, and connect the main unit to the other end of the cable. Push the start button, and the Spectris 110 automatically runs all the necessary tests. Green LEDs indicate if pairs 1/2, 3/6, 4/5 and 7/8 are wired correctly per the EIA-568 Specification. If faults are detected, red LEDs indicate the pairs at fault. The large LED will flash simple codes to signify the particular type of fault. A list of fault codes is printed on the front of the unit.

Battery-powered Spectris 110 is also easy to use for cable identification. Up to eight remote units, each with its own 1-8 identification number, can be inserted into wall jacks. Connect the main unit to the other end of the cable. In addition to providing fault codes or indicating that cable is wired properly, the large LED will display a number (1-8) to match the signal generated

by the remote. By using unique remote units, Spectris 110 provides one-person cable identification, wire-fault finding and cable verification. It also makes wire-mapping a snap!

Model 110 measures 1.3" x 2.8" x 3.7" and weighs .5 pounds. It comes with the number #1 remote identifier. You also get a 9-volt battery and instructions. One-year warranty. Additional remote identifiers listed below may be purchased separately.

900X110 Model 110

REGULAR PRICE\$379.00 ea.

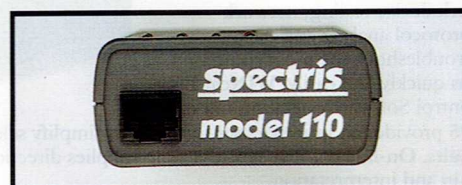
SPECIAL PRICE\$249.95 ea.

Additional Remote Indicators

The Spectris 110 is supplied with one Remote Indicator (#1). Additional indicators may be purchased as kits or individually. In fact, up to eight remote indicators can be used with and individually identified by a single Spectris 110. This reduces the need to reconnect a remote unit for each test. Our three-piece set (RI-3) includes #2-#4, and our complete seven-piece set (RI-7) includes #2-#8. Individual identifiers may also be purchased separately. Contact the SPC Sales Department for more information.

900X803 RI-3 Set of Three Identifiers (#2-#4)\$ 89.00 ea.

900X807 RI-7 Set of Seven Identifiers (#2-#8)175.00 ea.



Spectris 110 Specifications

Connector: RJ45

UTP Cable Length: 0-100 m

Split Pairs: Pairs are checked at 10 MHz and reported split if the crosstalk value is less than 21 dB \pm 3 dB between any two pairs.

Input Protection: Withstands continuous 56 V dc applied through 400- Ω telco loop. Withstands 175-V peak, 20-60 Hz through 100 Ω superimposed on 56 V dc for 100 ms telco ringing.

LED Display: Single-digit, 16-segment display. Four fault (red) and four no-fault (green) LEDs.

Power: Main unit, one 9-volt alkaline battery; remote units, none

Battery Life: Approximately 500 tests



NEXT-DAY DELIVERY
ONLY \$14.95!



E25 Series

High-Performance Mini Time Domain Reflectometers

- Compact, lightweight, battery-powered, quick fault-finding tools
- Five-button membrane keypad for simple setup and operation
- Backlit LCD screen with largest display of any mini TDR
- Pertinent information continuously displayed on screen
- Change function range without leaving fault display
- Short- and long-range models with four fixed ranges plus auto range

The Tempo Research E25 Series hand-held, battery-powered, single-waveform, mini time domain reflectometers accurately locate cable faults. Solid-state, user-friendly E2521 and 2520 models provide economical solutions to deploying high-performance TDR testing. They can be used on most types of cable from telecommunications such as twisted pair and coax to power distribution cables for repair and construction.

These E25 Series lightweight mini TDRs offer features typically found in larger, more complicated and expensive TDRs but at a fraction of the cost and learning curve. Easy-to-use, easy-to-interpret and easy-to-understand low-cost TDRs require minimal training. Increase productivity by improving clearing time and fault locating capabilities. Identify and locate shorts, opens, crosses, grounds, splits, water, bridge taps and load coils.

A five-button membrane keypad makes setup and operation a snap. The backlit 128 x 64 pixel graphic LCD is the largest of any mini TDR on the market. Use contrast control for optimum viewing. Pertinent information is continuously displayed on the screen. Setup changes may be made while viewing waveform. In range mode, adjust the balance control with the thumb wheel to cancel out transmitted pulse. Other features include single waveform and selectable pulse velocity from .01 to .99.

Batteries are housed in a compartment in the case bottom that is accessed by a lid with two retaining screws. These TDRs may be powered by manganese-alkali or ni-cad rechargeable batteries. An auto power down feature conserves battery life.

Choose from short- and long-range models. The rugged padded carrying case protects the TDR and has a rear compartment that is large enough to hold the included accessories and operations manual. Each 1.21-pound unit measures 7.5" x 3.5" x 2.25". One-year warranty.

E25 Series Specification Comparison

	E2521	E2520
Electrical		
Accuracy	±2% of range	
Ranges	30', 90', 300', 900' and auto	300', 900', 3000', 9000' and auto
Resolution	1% of range	
Input Protection	250 V ac/dc	
Velocity Factor	Variable from 0.01 to 0.99 in steps of 0.01	
Mechanical		
Case Material	ABS polycarbonate	
Battery Consumption without Backlight	100 mA nominal	80 mA nominal
Output Pulse		
Amplitude	5 volts peak to peak into open circuit	
Impedance	50 Ω	120 Ω
Pulse Width	Automatically varied by software for range selected	
Update Rate	Once per second for 5 minutes after last key depression	
Power Down	Automatic after 5 minutes with no key depression	

Model E2521

Short-Range 900-Foot TDR

Use the short-range TDR, Model E2521, for fault locating up to 900 feet. It includes four fixed ranges (30, 90, 300 and 900 feet) plus auto range. In addition to all the common series features, its output pulse impedance is 50 Ω, and battery consumption without backlight is 100 mA nominal.

This 900-foot TDR includes 6-foot safety test leads with clips, three-piece BNC adapter kit for coaxial cable use, six 1.5-volt "AA" alkaline batteries, carrying case and manual.

470X470 2521-5000 900-Foot TDR...1-2, \$1269.00 ea.; 3-up, \$1205.00 ea.

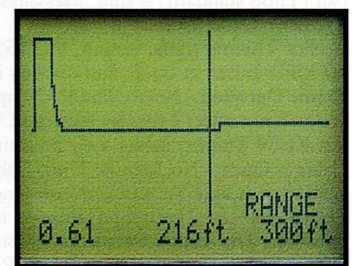
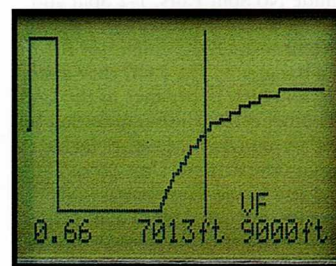
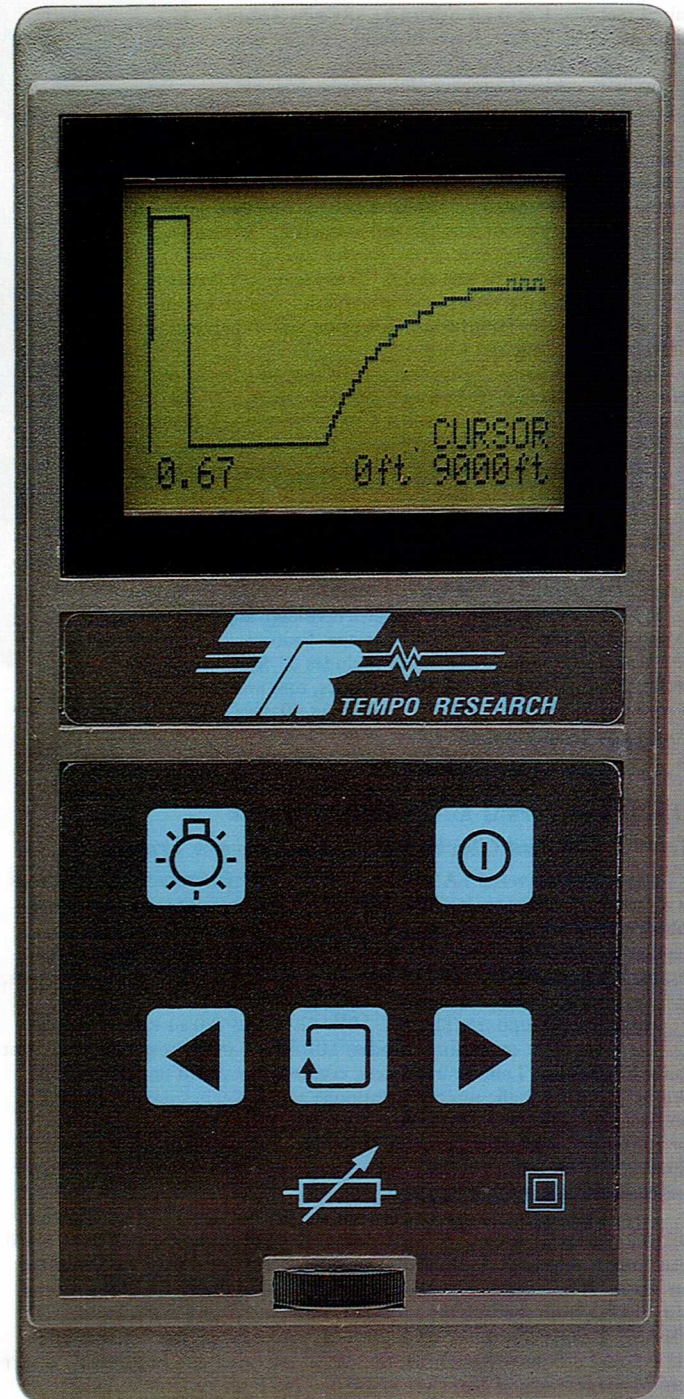
Model E2520

Long-Range 9000-Foot TDR

Model E2520 is the long-range TDR capable of locating faults up to 9000 feet. It includes four fixed ranges (300, 900, 3000 and 9000 feet) plus auto range. In addition to the series features, output pulse impedance is 120 Ω, and battery consumption without backlight is 80 mA nominal.

This 9000-foot TDR includes 6-foot test leads with popper clips, six 1.5-volt "AA" alkaline batteries, carrying case, VF reference card and manual.

470X213 2520-5000 9000-Foot TDR...1-2, \$1269.00 ea.; 3-up, \$1205.00 ea.



Spectris 63

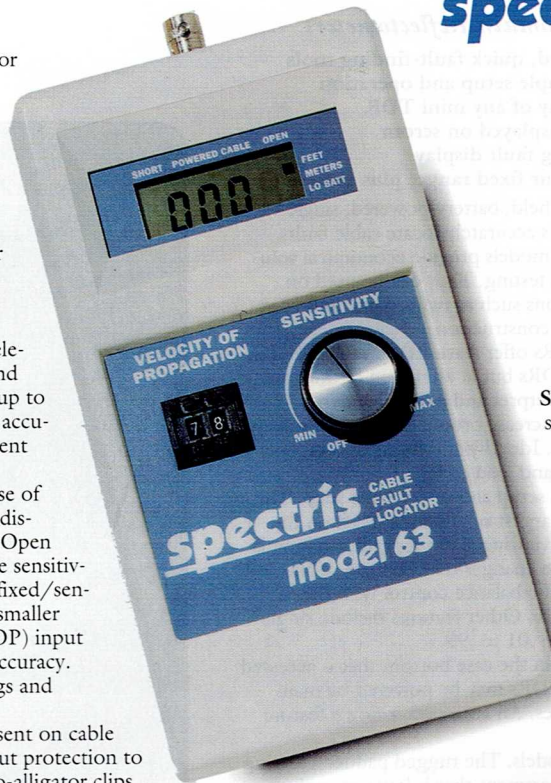
Economical TDR Cable Fault Locator

The hand-held Spectris 63 TDR Cable Fault Locator lets repair and maintenance technicians quickly test a variety of cables from coaxial and twisted-pair to paired metallic. Use it on Ethernet, ARCnet, Token-Ring, 10BASE-T, Star, Ring, Bus and virtually any LAN network plus telco, CATV, aircraft, shipboard and military cables. Compact, lightweight device is easiest, most versatile fault locator available.

Rugged, portable tester locates and identifies major cable faults, shortages and hidden damage causing impedance changes. Identifies discontinuities such as opens, shorts, corroded or damaged connectors, bad splices, water or rodent damage and tampering. As a telephone device, it tests cable drops, locates bad splices and finds twisted-pair opens and shorts. Testable length is up to 1999 feet (199.9 meters), pinpointing faults with $\pm 1\%$ accuracy. Measure cable lengths installed or on reel to prevent unnecessary splicing and labor.

Simple, one-button operation accesses a powerhouse of information. Distance to fault or cable end is instantly displayed in feet or meters on large 3.5-digit LED panel. Open and short indicators display fault types. Unique variable sensitivity control locates small faults that may be invisible to fixed/sensitive TDRs. Determine fault size, choosing to ignore smaller discontinuities. Two-digit Velocity of Propagation (VOP) input switch matches the 63 to cable under test for greater accuracy. VOP factors are listed in manual with simplified settings and instructions printed on the back of the 63.

Powered cable warning illuminates if voltage is present on cable to prevent accidental instrument damage. Features input protection to 250 V and low-battery indication. Includes 6" BNC-to-alligator clips probe, BNC-F, four AA 1.5-volt batteries, case and manual. The 1-pound unit is 7" x 3.9" x 1.7". Register in 30 days to extend warranty from 12 to 15 months.



spectris



SW-3 BNC/Mod Adapter — Rotate selector switch to let Model 63 test two-, four-, six- and eight-pair twisted-pair connectorized modular-type cables.

900X850 SW-3\$89.00 ea.

Spectris 63 Specifications

Input Connector: BNC
Range: 1999 feet (199.9 meters); maximum testable length varies with cable type
Input Protection: Up to 250 volts
Display: 3.5-digit LCD with power cable, open/short, low battery, meters/feet indicators
Velocity of Propagation: .01-.99
Resolution: 1 foot or .1 meter
Accuracy: $\pm 1\%$ of reading
Dynamic Range: 20 dBRL

900X063 Model 63.....1-5, \$499.00 ea.; 6-up, \$449.00 ea.

D520 Universal LAN Cable Tester

Tests Cables and Checks for Actual Network Traffic

The D520 Universal LAN Cable Tester is designed to address the needs of network installers, maintainers and administrators who support multiple cable types. It is affordable and easy to use with a unique set of features, making it a valuable addition to every troubleshooting kit. In addition to testing LAN cables up to 200 m long for proper continuity and termination, you can check for the presence of actual network traffic.

Model D520 supports Thinnet, 10BASE-T and Token Ring networks. Choose from eight operational modes: 10BASE-T traffic test, continuity test and split-pair test; Thinnet traffic test, continuity test and terminator test; plus Token Ring traffic test and continuity test. All functions are controlled with a single rotary switch on the front panel. When testing installed cables for continuity, start with a traffic test to make sure you haven't accidentally plugged into an active network. All messages are shown on the LCD. Error messages are accompanied by a beep.

Test 10BASE-T circuits for network activity using the RJ45 connector. D520 looks for a 10BASE-T hub at the other end of the cable. Message will read Link Established or No Hub Detected. Network activity is shown as a bar graph. If no packets are seen, None appears on the LCD. If the receive pair coming from the hub is backwards, Reverse Polarity is displayed. 10BASE-T cable continuity testing checks cables for proper connection on the 1-2 and 3-6 pairs. Attach the remote to the other end of the cable under test. Messages include Not Connected or - No Remote Unit and Cable is Good - Remote Unit Seen. If a wire is open, shorted or swapped, the display might appear as: 1 Open, 3 Short 6 or 1 Swap 2. In 10BASE-T split-pair testing mode, the D520 performs a NEXT measurement to determine if any pair (T568 standard) is split. Messages include No Split Pairs, 1-2 Split and Excessive Cable Noise.

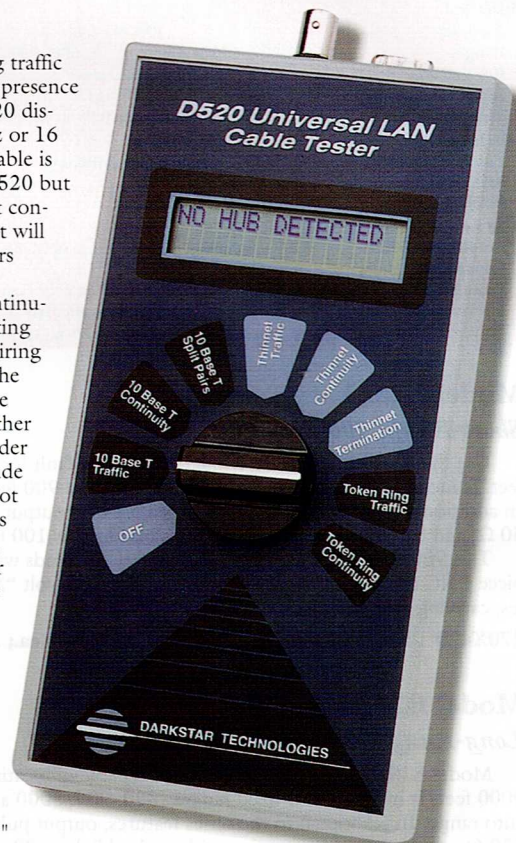
For Thinnet traffic testing, the D520 monitors its BNC connector for 10-MHz Ethernet traffic and displays it as a bar graph. The LCD may display Traffic Detected - None. The D520 appears as a high impedance to the LAN and will not affect Ethernet packets. Use Thinnet cable continuity testing to test RG58 Thinnet cables for continuity and termination. Messages include Cable is Open - No Remote Unit, Cable is Good - Remote Unit Seen, Cable is Shorted, Cable Terminated - on One End and Cable Terminated - on Both Ends. Use Thinnet termination testing on individual 50- Ω Thinnet terminators. The display shows the measured resistance to within $\frac{1}{10} \Omega$. If it is not in the range of 49-51 Ω , Out of Range is displayed.



Use Token Ring traffic mode to detect the presence of LAN traffic. D520 displays None, 4 MHz or 16 MHz. If a station cable is plugged into the D520 but the other end is not connected to a MAU, it will display Shorting Bars Detected.

Token Ring continuity testing is for testing cables for correct wiring from end to end. The remote unit must be connected to the other end of the cable under test. Messages include Open Shield or - Not Connected, Cable is Good, Black Open, Red Short Green or Black Swap Orange and Shorting Bars Detected.

Model D520 is powered by a 9-V alkaline battery. Includes Power Good and Low Battery indicators. The 4" x 7.5" x 1.3" unit and 3.2" x 4.3" x 1.5" remote together weigh 2 pounds. One-year warranty.



805X600 D520 LAN Tester1-5, \$790.00 ea.; 6-up, \$750.00 ea.



Ethertest®

PC-Based Ethernet LAN Analyzer

- Turns your PC into a powerful Ethernet analyzer
- Portable PCMCIA version for notebook PCs
- ISA slot-card version for desktop PCs
- Smart alternative to expensive LAN analyzers

Ethertest® is a feature-packed product which simplifies network maintenance and troubleshooting at an affordable cost. It is a smart alternative to expensive and complicated LAN analyzers. You no longer need to be a LAN guru to troubleshoot a network. EtherTest helps first-tier troubleshooters understand what is happening on the network right from the start. The displays are intuitive, easy to read and quickly provide a wealth of information. Although it is simple to use, EtherTest still delivers sophisticated, detailed information for heavy-hitter network specialists.

As soon as you connect EtherTest to your network, you'll see overall network statistics for utilization and errors clearly presented on one summary screen. If you need a more detailed view, the Source Node window will show which nodes are generating traffic and errors.

Use review mode to look at individual packets. It tells you everything about a packet including source and target nodes, packet type, timestamp, packet size, physical errors such as CRC, actual hex data contained in the packet and a detailed seven-layer protocol decode. Filters easily cut through large amounts of network traffic and focus on problem areas. Capture filters limit the data captured, and display filters are used when viewing captured data. You can filter on MAC address, IP address and errors.

EtherTest is an extremely versatile tool. Network technicians appreciate its clarity and ease of use. Favorite features of network managers include the strong alarm and node database support which includes duplicate IP address detection. Network specialists and software developers enjoy EtherTest's Protocol Decode Language feature which permits them to customize supplied decodes or create their own to handle proprietary decodes.

Use portable PCMCIA version for notebook PCs. ISA slot-card version is for desktop PCs. Each also includes 3.5-inch disk, DNC-T connector, coax and UTP cables, *Hardware Installation and System Configuration Guide* plus *User's Manual*. Thirty-day warranty.

EtherTest® ETPCM with PCMCIA Card

555X0711-2, \$2990.00 ea.; 3-yr, \$2695.00 ea.

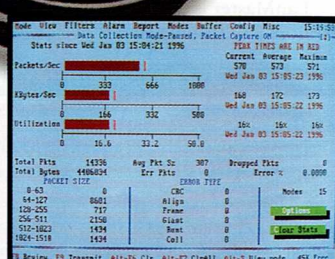
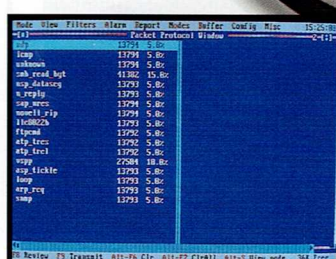
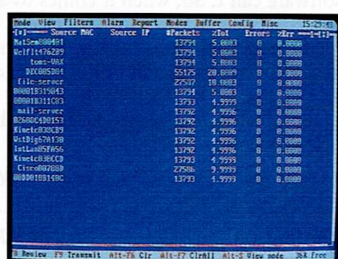
EtherTest® ETISA with ISA Card

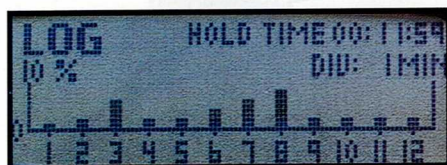
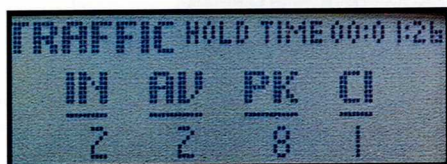
555X0891-2, \$2990.00 ea.; 3-yr, \$2695.00 ea.

EtherTest® Features

- Statistics view summarizes network usage and errors
- Quickly locates Duplicate IP addresses
- Tracks error-generating nodes
- Detailed seven-layer packet decoding for all major protocols
- Save captured data to disk for later review and/or playback
- Filters for MAC or IP address, protocol type and errors
- Generates traffic (playback captured data, define your own packets or use random addresses and data)
- Tracks nodes by MAC address, IP, address and user-defined names
- Set alarms for high error rates, heavy traffic, absence of traffic, packets sent by specific nodes and packet types
- Displays network usage by protocol type in real time
- Define and save an unlimited number of node-name databases and test configurations
- View network traffic graphically with "sky-line" and "protocol tree" views
- Built-in Protocol Definition Language allows you to define your own decodes for proprietary protocols
- Sniffer export and import utilities provided for capture files

Frontline™





LanMaster™ Data Clamp Connectionless LAN Monitor

- Your first response tool for diagnosing network problems
- Designed for network administrators and technicians
- On-the-spot network assessments
- Traffic and log operating modes
- The one tool that's all you need

The revolutionary LanMaster Data Clamp from Harris Dracon offers the network technician a way to conduct unobtrusive high-speed network testing. Thanks to a unique inductive sensor that reads data signals through UTP, STP and coaxial cables, splitters and disassembly are unnecessary. In fact, the LanMaster gives today's maintenance professional the fastest physical-layer testing available for Ethernet and Token Ring networks.

This easy-to-use data clamp lets you verify connectivity, measure network segment loading and log traffic levels with greater speed. All you do is open the data clamp and insert the cable. The data clamp closes and aligns automatically, providing connectionless analysis and troubleshooting for a variety of LAN conditions. You'll get the highest level of network productivity combined with long-term reliability.

LanMaster is designed for administrators and technicians. Moves,



LanMaster Data Clamp Operating Modes

Traffic Mode

Delivers real-time network statistics including instantaneous, average and peak utilization. Provides bandwidth information for system planning and resource allocation.

Log Mode

Records and graphically presents network loading over time. Provides unattended traffic level logging from 12 minutes to 24 hours.



adds and changes are a constant part of every network, so staying up to date is important. The data clamp simplifies tracking with only a few minutes needed to locate dead drops, verify good punchdowns and isolate choke points in one or more segments. Facilities managers can verify dark-cable inactivity prior to upgrades or changes, and new users can perform tests without affecting system operation.

Use LanMaster for on-the-spot network assessments. Monitor and record traffic patterns on an instantaneous, average or peak basis. It can log activity versus time at intervals ranging from 12 minutes to 24 hours. Network safety is yours at all times with the data clamp's advanced warning system. An audible tone sounds whenever the traffic threshold is exceeded, and a five-point index indicates the probability of collisions occurring within a network segment.

System administrators and technicians will manage and maintain their systems more quickly and effectively with this portable, handheld unit. The user interface features 110 x 32 graphic LCD, 10 LED indicators and audible status monitor. Choose from traffic and log operating modes. This LAN monitor also can spot "no packet" conditions that even the most expensive software can't. So, when it comes to at-a-glance system diagnosis, nothing else compares to the LanMaster Data Clamp.

Choose from two models. Each includes two AA alkaline batteries and an ac adapter for extended operation. Model 100RS adds an RS232 interface and exclusive DataView™ software for data downloading to a personal computer or other user terminal. Each 8.1-ounce unit measures 6.9" x 2.9" x 1.1". One-year warranty.

25600-001 Standard LanMaster 100 Data Clamp
350X5251-2, \$749.00 ea.; 3-up, \$720.00 ea.

25600-002 LanMaster 100RS with RS232 Interface and Software
350X5301-2, \$899.00 ea.; 3-up, \$864.00 ea.



FrameScope 802

Pocket-Sized LAN Analyzer Zooms in on Network Problems

- The first model for Ethernet and Token Ring (4 and 16 Mbps)
- Monitors all statistics simultaneously by station
- Identifies Netware, IP, DECnet and AppleTalk protocols in use
- Echo test network and TCP/IP devices verify end-to-end connectivity
- Lists top talkers plus frame and error types per station

FrameScope 802 is the first pocket-sized LAN troubleshooter to solve both Ethernet and Token Ring problems on unshielded twisted-pair, shielded twisted-pair, coax and fiber media. It simultaneously monitors all statistics on LANs with up to 256 workstations, performs echo tests, checks configuration of specific stations, generates and filters traffic plus plots statistical histories. The multitasking operating system lets you move quickly from one application to another. FrameScope's portability, ease of use and reasonable price make this packet-filtering device the ideal tool for network managers and field service personnel.

Menu choices include performance plots, event analysis, error analysis, traffic analysis, packet capture and stress tests. You can measure numerous network performance statistics including utilization, traffic breakdown by station or protocol

and error breakdown by error type and station. The 2.5" x 1.5" backlit screen displays a wealth of information.

Parameters appear as numbers and on a moving bar graph with high and low peaks updated every two seconds. Two graphs on one screen display total frames and errors with utilization and number of network devices for easy comparison. Stop the statistic-gathering process at any point for detailed analysis of captured interval. Audible alarms signal critical errors that are indicated in status line advice capsules.

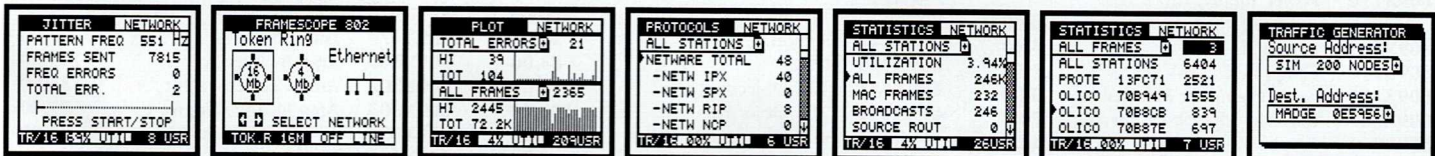
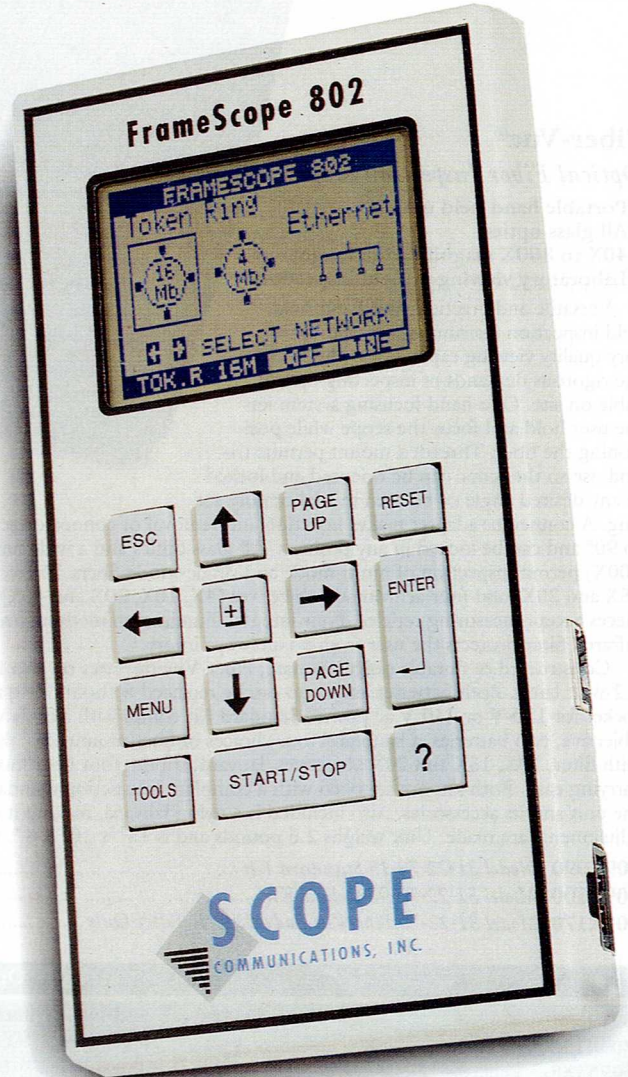
FrameScope 802 Specifications

Ethernet Statistics: Utilization, frame count, broadcasts, multicasts, collisions, multiple collisions, excess collisions, late collisions, carrier sense errors, framing errors, link errors, alignment errors, in-range errors, CRC errors, long frames and short frames

Token Ring Statistics: Utilization, LLC util, MAC util, frame count, broadcasts, source routed frames and functional frames; Isolating Errors — Line, internal, burst, ac errors and aborts; Non-Isolating Errors — Lost frames, receiver congestion, frame copy, token errors and frequency errors; Multiple monitors, active monitor error, duplicate addresses, CRC errors, ring poll errors, ring purges and beacons

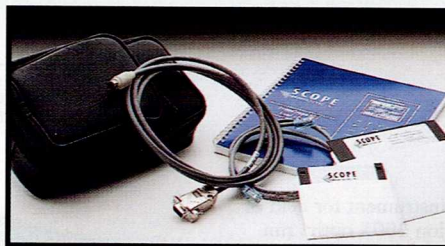
Protocols: High-level protocols are correctly identified and counted along with the encapsulating frame type — Netware IPX, SPX, RIP and NCP within Ethernet, 802.2, 802.3, 802.5 or SNAP; Appletalk (1.0 and 2.0) LAP and AARP within Ethernet or SNAP; IP, TCP, UDP and ARP within Ethernet or SNAP; DECnet within Ethernet

Test Ports: Shielded RJ-45 port allows connection to UTP or TP Token Ring and 10BASE-T Ethernet networks; AUI port allows connection to coax or fiber optic media and requires external ac adapter



Troubleshooting tools examine individual devices to speed up network problem isolation. Stats by station lists stations in order of activity to locate top talkers, broadcasters and error sources. FrameScope zooms in to display a comprehensive list of statistics and error types for any station. Filters examine traffic to or from a particular station or to monitor a session between two stations. Filters and station statistics can monitor traffic rates, protocols in use and frame encapsulation methods.

Echo tests generate IP pings and network diagnostic frames to test devices, even across bridges and routers. They can find bad NIC cards, cables and MAUs as well as misconfigured bridges and routers. Stress tests help identify weak links and can run while you access



another tool. Traffic generator can simulate traffic from up to 200 stations. Three tests are Token Ring specific. Lobe test checks the link between FrameScope and the MAU. Signal strength measures and rates voltage of the incoming signal. Jitter test checks for excessive jitter vulnerability.

Tests may be stored for 500 stations over 30 time intervals. The serial port's eight-pin micro-DIN connector enables PC or printer connection. Includes built-in UTP and AUI adapter ports.

Choose from three models: Ethernet (EN) Only, Token Ring (TR) Only and Combination (EN+TR). Each 1.3-pound unit is 7.5" x 4" x 1.5". Includes PC software, UTP cable, RS-232 cable, ni-cad battery pack, ac adapter and carrying case with belt clip. One-year warranty.

- 820X417** 12017 FrameScope 802/EN Only.....1-2, \$2740.00 ea.; 3-up, \$2603.00 ea.
820X418 12018 FrameScope 802/TR Only.....1-2, 2740.00 ea.; 3-up, 2603.00 ea.
820X416 12016 FrameScope 802/EN+TR.....1-2, 3985.00 ea.; 3-up, 3786.00 ea.

Optional Accessories

- Universal AC Adapter for 220 V**
820X850 65033.....\$180.00 ea.
Token Ring STP Adapter Cable — Measures 48 inches long with IBM-Type 1 and RJ45 connectors.
820X605 16006.....\$50.00 ea.

- Attachment Unit Interface Adapter Cable** — Measures 48 inches long with DB15 and 12-pin connectors.
820X707 16007.....\$130.00 ea.

- Large Carrying Case** — Room for FrameScope, WireScope, ac adapter, cables and manual.
820X200 11001.....\$180.00 ea.



Fiber-Vue®

Optical Fiber Inspection Scope

- Portable hand-held unit
- All glass optics
- 40X to 800X magnification range
- Laboratory viewing or field inspection

Versatile and practical, this hand-held field inspection instrument provides laboratory quality viewing capabilities, plus it meets the rigorous demands of inspecting optical cable on site. One-hand focusing system lets the user hold and focus the scope while positioning the fiber. Threaded mount permits tripod use so the scope can be oriented and locked at any desired angle or be used in a laboratory setting. A connector adapter makes insertion and removal of connectorized fibers easy. Adapters rotate up to 90° and can be locked in any position. All glass optics and a wide magnification range (40X to 800X) permit inspection of multi-mode and single-mode fibers. Three widefield eyepieces (10X, 15X and 20X) and four achromatic objectives (4X, 10X, 20X and 40X) are standard. The eyepieces accept measuring reticles. Four integral illumination methods are included. A built-in infrared filter protects the user from possible eye injury.

Constructed of durable polycarbonate, Fiber-Vue operates on two D cell batteries with a 1.2-watt lamp. Both batteries and lamp can be replaced without using tools. Equipped with a socket for 120-V or 240-V ac power. Standard Kit comes with a body with filter, a 15X eyepiece, a 10X objective, two batteries, a lamp and four choices of fiber mounts ($\frac{1}{16}$ "- $\frac{1}{8}$ ", $\frac{1}{8}$ "- $\frac{1}{4}$ ", $\frac{3}{16}$ " and bare). Deluxe Kit includes a body with filter, 10X, 15X and 20X objectives, lanyard, tripod, four fiber mounts ($\frac{1}{16}$ "- $\frac{1}{8}$ ", $\frac{1}{8}$ "- $\frac{1}{4}$ ", $\frac{3}{16}$ " and bare) plus eyeguard and carrying case. Both kits are supplied with a complete instruction manual. Rugged composition case with foam inserts protects the unit and its accessories. Also included is a nylon lanyard, making it easy to keep Fiber-Vue close at hand while on-site fiber adjustments are made. Unit weighs 2.5 pounds and is 15" x 10" x 5". One-year warranty.

809X090 Model 31-22-70-15 Standard Kit.....1-2, **\$483.00 ea.**; 3-up, **\$459.00 ea.**

809X100 Model 31-22-70-98 Deluxe Kit.....1-2, **\$895.00 ea.**; 3-up, **\$864.00 ea.**

809X170 Model 31-22-70 FiberVue Body with IR Filter Only.....1-2, **\$344.00 ea.**; 3-up, **\$327.00 ea.**

Optional Accessories

Stock Number	Description	Price (each)	Stock Number	Description	Price (each)	Stock Number	Description	Price (each)
809X187	Bare Fiber Mount	\$ 1.50	809X324	NTT-FC Adapter	\$31.00	809X186	Fiber Mount $\frac{3}{16}$ "	\$ 2.00
809X188	Reflector	6.00	809X380	Reticle for 10X Objective	44.00	809X171	10X Eyepiece	22.00
809X189	Holster	60.00	809X381	Reticle for 20X Objective	44.00	809X172	15X Eyepiece	23.00
809X190	Power Supply, 120 V, UL and CSA	36.00	809X382	Reticle for 40X Objective	44.00	809X173	20X Eyepiece	20.00
809X199	Battery, D Cell	3.50	809X429	Eyeguard	6.00	809X174	4X Objective	64.00
809X290	Lamp, PR2, 2.4 V	1.50	809X179	Tripod	19.00	809X178	Lanyard	6.00
809X301	Large Clamp for Mounts	49.00	809X180	Case	83.00	809X300	Amp Adapter Set	119.00
809X307	Bayonet Adpt/St Connector	32.00	809X181	10X Objective	98.00	809X302	Amp Connectr Adpt for F/V	35.00
809X321	Amphenol Adapter	44.00	809X182	20X Objective	108.00	809X303	Amp Flange Adpt for F/V	37.00
809X323	Dorran Adapter	72.00	809X183	40X Objective	185.00	809X304	Amp-FSMA Adapter	32.00
			809X184	Fiber Mount $\frac{1}{16}$ "- $\frac{1}{8}$ "	2.00	809X306	NEC D4 Adapter	38.00
			809X185	Fiber Mount $\frac{1}{8}$ "- $\frac{1}{4}$ "	2.00			

OFS 300 Optical Fiber Scope

Versatile, Affordable Instrument

- Hand-held portable scope
- 200X optical magnification
- Features laser safety filter

Noyes Fiber Systems OFS 300 is the most versatile instrument for field or laboratory inspection of optical fiber connectors. Precision 200X optics simplify inspection for scratches, dirt and other problems normally associated with poor transmission performance. This scope can inspect all connector types. It features optical connection through a universal adaptor mount with an optional adaptor cap accessory. Inspection of cleaved ends is also possible by using the optional Bare Fiber Adaptor accessory. A built-in laser safety filter prevents injury when viewing an active channel.

The OFS 300 is designed to be compact, rugged and easy to use. A momentary power switch is conveniently located on top of the scope, keeping one hand free for focusing. Two AA alkaline batteries power the scope for a minimum of four hours. Includes inspection microscope OFS 300 and operations manual. The 2-pound unit measures 5" x 2" x 8". One-year warranty. Optional accessories include a carrying case and six adaptor caps.

812X430 OFS-300-200.....1-2, **\$599.00 ea.**; 3-up, **\$569.00 ea.**

812X435 OFS Case.....70.00 ea.

812X202 ST Adaptor Cap.....60.00 ea.

812X200 FC Adaptor Cap.....60.00 ea.



812X209 SC Adaptor Cap.....\$99.00 ea.

812X203 SMA Adaptor Cap.....60.00 ea.

812X205 FDDI Adaptor Cap.....99.00 ea.

812X206 Bare Fiber Adaptor Cap.....99.00 ea.



MLP 1-2 Multimode Light Pack

Optical Light Source and Power Meter in a Test Kit

- Small size is field portable
- Affordable and easy to operate
- Multimode and singlemode

This multimode fiber optic loss test kit combines an optical light source with an optical power meter and an ST adaptor cap in one convenient package. Together they offer accurate loss measurements on all fiber optic networks. Multimode wavelength is 850 and 1300 nm. Singlemode fiber measurements are limited to approximately 8- to 10-km distance.

Model OLS 1-2 Optical Light Source is a practical instrument for measurements on datacom, local loop or long haul networks. This reliable, dual-LED source has an illuminated power switch and a wavelength select slide switch. Low battery is indicated when the power switch LED starts blinking. Specifications include: Wavelength of Multimode Systems (850/1300 nm), Spectral Width (40/100 nm), Output Power (-20/-20 dBm), Fiber Size (62.5/125 μ m) and Connector Style (ST).

The OPM 1-2B Optical Power Meter measures optical power at 850, 1300 and 1550 nm. Utilizing state-of-the-art surface-mount technology, this compact unit includes all the necessary features for accurate LAN testing. Optical connection is made via the universal connector assembly located on top of the meter. It features a 3.5-digit LCD, automatic shut off if left unattended for over five minutes and low-battery indicator. Specifications include: Calibration Wavelength (850, 1300, 1550 nm), Detector (Ge), Dynamic Range (+5 to -50 dBm), Accuracy @ 25 C (± 0.25) and Resolution (.1 dB).

Both units described above are packaged in a durable, brown, hard plastic carrying case. It measures 8.5" x 8" x 3.5" and weighs 1.7 pounds. Egg crate-type foam fills the lid. The bottom contains three layers of foam with the top layer custom cut to secure and protect each of the two test instruments. The 6-ounce OLS 1-2 Optical Light Source measures 4.5" x 2.4" x 1", and the 5-ounce OPM 1-2B Optical Power Meter measures 4.25" x 2.4" x 1". Each comes with a laminated instruction card. An ST adapter cap and kit instructions are also included. One-year warranty.

812X300 MLP 1-2 Test Kit1-2, \$1389.00 ea.; 3-up, \$1299.00 ea.

MLP 4-2 Multimode Light Pack

Optical Light Source and Power Meter in a Test Kit

- "Next Generation" product
- Germanium detector
- dBm (power) and dB (loss) modes

Like the MLP 1-2, this multimode fiber optic loss test kit combines an optical light source with an optical power meter and an ST adaptor cap in one convenient package. Together they offer accurate loss measurements on all fiber optic networks. Both singlemode and multimode are available. In place of the OPM 1-2B, the MLP 4-2 offers the even more versatile OPM 4-2.

The OLS 1-2 Optical Light Source is a practical instrument for measurements on datacom, local loop or long haul networks. This reliable, dual-LED source has an illuminated power switch and a wavelength select slide switch. Low battery is indicated when the power switch LED starts blinking. Specifications include: Wavelength of Multimode Systems (850/1300 nm), Spectral Width (40/100 nm), Output Power (-20/-20 dBm), Fiber Size (62.5/125 μ m) and Connector Style (ST or SMA).

Designed to measure optical signals at 850, 1310 and 1550 nm, the OPM 4-2 is suitable for singlemode and multimode applications. This handheld unit is small enough to fit into a shirt pocket, yet it offers a variety of features not found on similar units. With this kit, the user can easily test LANs, WANs, local loop, CATV or long haul fiber optic systems. All measurements are fully N.I.S.T. traceable. A single 9-V battery typically provides over 60 hours of operation. A low battery annunciator will indicate when the battery should be replaced. OPM 4-2 automatically powers down in approximately five minutes if no keys are pressed. This auto-shutdown feature can be disabled if desired. A reference value can be set for each wavelength independently of each wavelength, accommodating the output levels of various light sources. References are saved in memory even if the battery is removed. Without losing the N.I.S.T. traceable references, this feature allows the user to set references in the morning, take measurements all day — even all week long — while switching between wavelengths and dB and dBm modes.

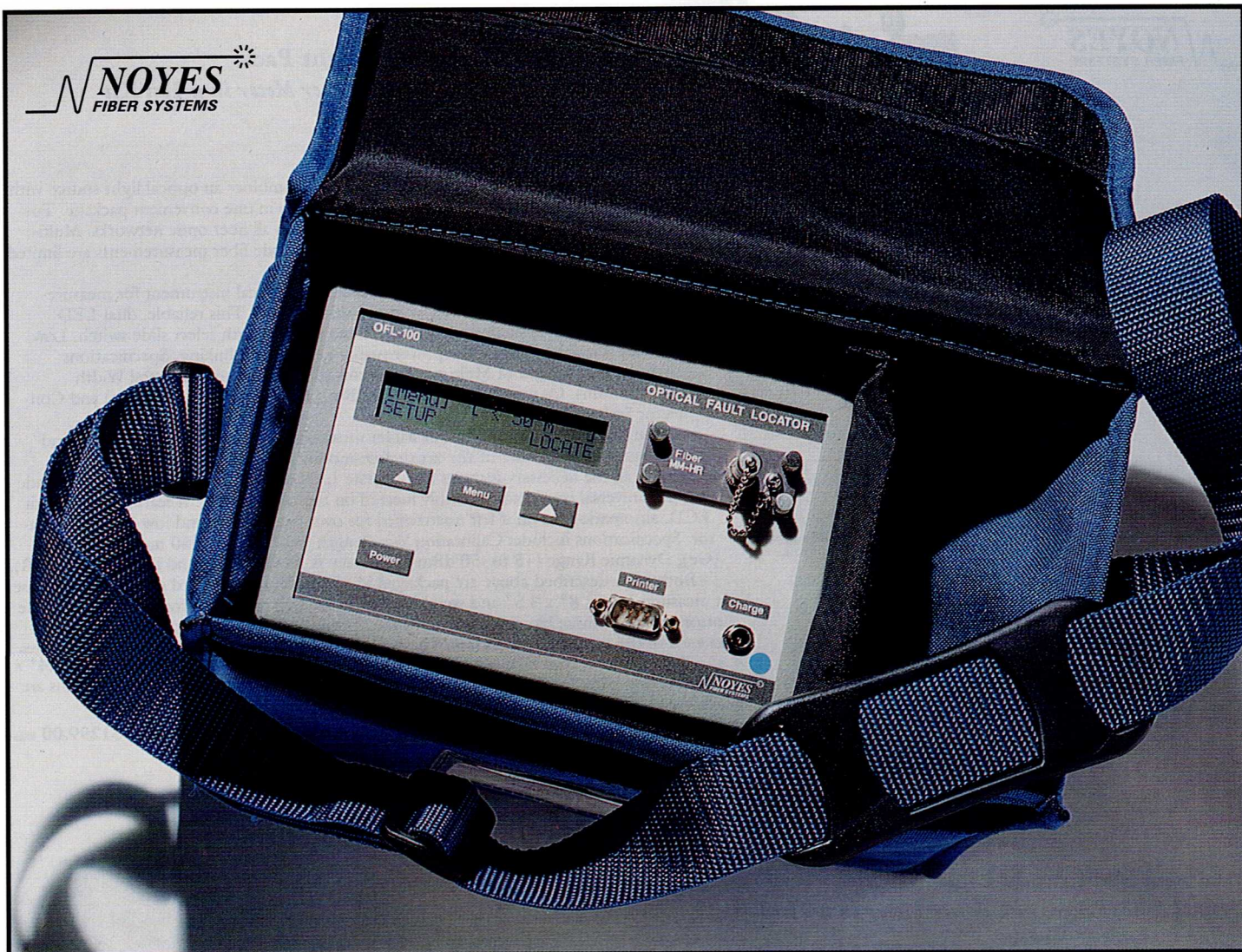
Optical connections to the OPM 4-2 are made via the Universal Adapter Mount on the top of the unit. The necessary adaptor cap to mate a fiber to the OPM 4-2 is included in the MLP 4-2 kit. Measurements are easy to read

on the high-contrast liquid crystal display. Specifications include germanium detector, dBm (power) and dB (loss) modes with 0.01-dB resolution, auto or manual power off, overrange and under-range indicators and a feature that sets references even when the battery is removed. These features combine to make the OPM 4-2 the best performance vs. cost optical power meter on the market.

Both the OLS 1-2 and the OPM 4-2 are packaged in a durable, brown, hard plastic carrying case. It measures 8.5" x 8" x 3.5" and weighs 1.7 pounds. Egg crate-type foam fills the lid. The bottom contains three layers of foam with the top layer custom cut to secure and protect each of the two test instruments. The 6-ounce OLS 1-2 Optical Light Source measures 4.5" x 2.4" x 1", and the 7-ounce OPM 4-2 Optical Power Meter measures 4.5" x 2.75" x 1". Each comes with a laminated instruction card. An ST adapter cap and kit instructions are also included. One-year warranty.

812X320 MLP 4-2 Test Kit1-2, \$1540.00 ea.; 3-up, \$1449.00 ea.





OFL 100MM Optical Fault Locator

Measures Multimode Optical Fiber Networks

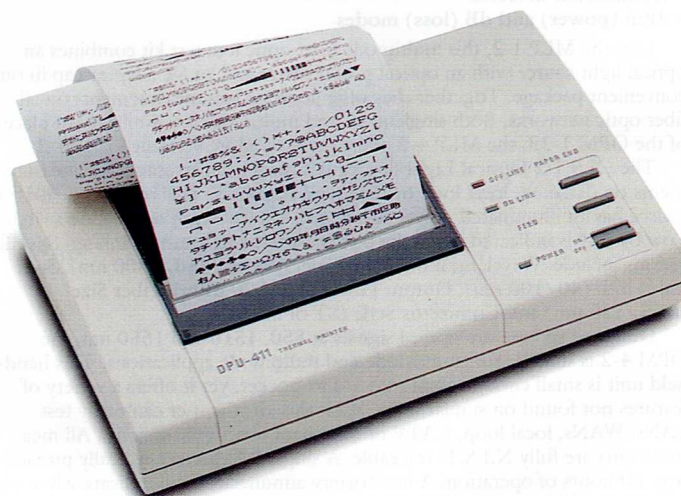
- Hand-held and portable with simple one-button operation
- Quickly performs complete OTDR trace analysis; displays results instantly
- Provides hard copy output with optional standalone thermal printer

OFL 100MM Optical Fault Locator performs quick maintenance and troubleshooting measurements on multimode optical fiber networks. It is designed for datacom applications to distances of 2 km. This instrument combines high accuracy and ease of use to locate breaks or faults on multimode spans. Restoration is quickly performed at a fraction of the cost of conventional OTDRs.

Features include internal storage of up to 50 traces and RS-232 trace transfer to DOS-based computer (version 3.3 or higher). Complete OTDR trace analysis includes two-point splice loss measurements with .01-dB resolution using A and B cursors, vertical and horizontal expansion of trace plus trace overlay from previously stored traces. Event function automatically lists splice loss values in tabular format up to seven events. Edit function allows user to identify date, cable ID, fiber ID, user and location. Five selectable threshold levels let operator quickly determine magnitude and location of events in excess of 0.25, 0.5, 1.0, 2.0 and 4.0 dB. Number of faults, loss and location are immediately and simultaneously displayed on easy-to-read, two-line-by-20-character display. Integrate trace currently displayed to Word for Windows software for documentation. Easily document LAN and WAN installations.

The 8-pound OFL is 5" x 7.5" x 6". Rechargeable batteries provide extended operation; ac adapter provides indefinite use. Includes ST (Standard) Optical Connector Interface and manual in protective carrying case. One-year warranty. This OFL offers individual trace or batch print-out capability (RS-232) for hard copy qualification. Optional standalone thermal printer includes ac adaptor, thermal paper roll and interface cable. The 2.25-pound printer is 9.5" x 6" x 2.25". One-year warranty.

812X400 OFL 100MM Locator.....1-2, \$4990.00 ea.; 3-up, \$4700.00 ea.
812X405 OFL Thermal Printer.....490.00 ea.



OFL 100MM Specifications

Fault Detect Range: 3 km multimode (62.5/125 μ m fiber)

Distance Measured (Reflective): 10 m-3 km

Measurement Time: 20 seconds (end of fiber); 45 seconds (several faults)

Optical Connector Interface: ST (standard)

Print-Out Enable: RS-232

Distance Display Units: Meters or feet

Threshold Levels: 0.25, 0.5, 1.0, 2.0, 4.0 dB

Refractive Index: 1.400-1.500

Laser Classification: Class 1, 21 CFR 1040





D400 Series Models D410/D412

Pocket Fiber Testers

- Affordable quality and performance
- Pre- and post-installation testing
- Choose ST or SMA connectors

The Darkstar D4000 Series stand-alone units are designed for wire spoil testing. They provide an approximated value for making continuity checks and testing for damaged cables. These Pocket Fiber Testers are a simple, affordable alternative for checking multi-mode fiber cables and connectors. No other testers on the market offer this much quality and performance in this price range. They're easy to use and small enough to fit in a shirt pocket or portable tool kit.

If you have access to both ends of a terminated fiber, you can test it with the D410 or D412 simply by looping it across the tester's transmitter and receiver connectors. If you need to test installed fiber runs between different locations, consider purchasing separate light source and receiver accessories.

Series 400 testers save time and free up more costly test equipment when you need just a quick operational test. Since each D400 Series unit contains both a source and a receiver, it can be used to test a loop or a spool of cable. A pair of testers can be used to test long fiber runs between buildings.



D400 Series Specifications

Output Wavelength:	850 nm \pm 20 nm at 3 dB down
Optical Power Out:	-20 dBm \pm 0.5 dBm into 100- μ core -23 dBm \pm 1.0 dBm into 62.5- μ core -26 dBm \pm 1.0 dBm into 50- μ core
Indicator Range:	-22 dBm to -40 dBm
Indicator Resolution:	2 dBm

Test cables before and after installation with the easy-to-read bar graph display. The readout gives you an absolute measurement of the optical power coming into its receiver. The scale is calibrated in 2-dBm steps with a range of -22 to -40 dBm. To estimate the loss in your fiber, subtract the power being received from the -20 dBm at 850 nm power output being launched by the tester.

Choose from ST or 905 SMA connector models, each powered by a 9-volt battery. Three accessories enable end-to-end testing when both ends of the cable are not available. The 850 Nanometers are light source power units. Use the D420 ST version with Model D410; the D422 SMA version with Model D412. The D430 ST Receiver is used with Model

D410. The .28-pound testers measure 4.5" x 2.3" x 1". Each .28-pound accessory is 4.5" x 2.3" x 1". One-year warranty.

805X410	D410 ST Fiber Tester	1-5,	\$295.00 ea.;	6-up,	\$279.00 ea.
805X412	D412 SMA Fiber Tester	1-5,	295.00 ea.;	6-up,	279.00 ea.
805X420	D420 ST 850 NM Source Only		195.00 ea.		
805X422	D422 SMA 850 NM Source Only		195.00 ea.		
805X430	D430 ST Receiver Only		195.00 ea.		

OLTS Optical Loss Test Set

Fiber Solution Kit

- Rapid identification of common fiber optic network problems
- Complete fiber solution for Ethernet, Token Ring and FDDI
- Intuitive, easy-to-use interface focused at LAN administrators
- Quick, accurate end-to-end power and loss measurements

Comprehensive Fiber Solution Kit is the first test set to meet the challenges of installing, maintaining and troubleshooting all major fiber optic LANs. Microtest combined two palm-sized fiber optic diagnostic tools in Optical Loss Test Set (OLTS). FiberEye™ Optical Power Meter (OPM) and FiberLight™ Optical Light Source (OLS) provide excellent price and performance. Begin troubleshooting right out of the box with nothing else to buy! Easy, rapid identification of typical failure points lets LAN administrators restore critical network operation quickly and accurately. Diagnostic tools are designed for fiber-based Ethernet, Token Ring and Fiber Distributed Data Interface (FDDI) networks. Universal adapters support existing and new fiber optic installations. Quickly identify fiber optic cable plant as cause of reported network problems.

FiberEye assesses performance of fiber optical transmission paths and equipment without new terminology or complex equipment. Measure power of light at any point injected into or emerging from fiber network. Verify proper installation and operation of such active fiber optic components as fiber optic hub modules, connectors, repeaters, adapter cards, multiplexers, etc. Test passive components like fiber couplers (point-point, Star, "T"). Measure signal loss to identify faulty patch cables, failing splices or bad couplers and connectors. Easy-to-use, four-button interface. Simple press selects network type. Perform continuity checks, transmit/receive power level checks and end-to-end system tests. Large LCD indicates accurate, repeatable measurements.

FiberEye OPM Specifications

Accuracy/Linearity:	\pm 0.2 dB
Amplifier Design:	Linear
Applications:	Ethernet, Token Ring, FDDI
Calibrated Wave Length:	850 nm, 1300 nm
Calibration Period:	12 months
Display Resolution:	0.01 dB
Dynamic Range (Power):	+3 to -55 dBm
Optical Adapter:	Universal
Photodiode Type:	Germanium
Power Source:	Two AA batteries
Battery Life:	100 hours

FiberLight OLS Specifications

Applications:	Ethernet, Token Ring, FDDI
Source Type:	Light-Emitting Diode
Wavelength (nm):	850 nm, 1300 nm
Power Launched into:	850 nm 1300 nm
100/140 mm Fiber:	13 dBm -12 dBm
62.5/125 mm Fiber:	-13 dBm -14 dBm
50/125 mm Fiber:	-14 dBm -16 dBm
Power Output Accuracy:	\pm 2 dB \pm 0.5 dB
Optical Adapter:	Universal
Power Source:	Two AA batteries
Battery Life:	Eight hours

Microtest



FiberLight provides consistent, calibrated light output level to increase testing ease and effectiveness. Two highly efficient LEDs with external connectors provide safety. One transmits at wavelength for Ethernet and Token Ring networks; the other, for FDDI

networks. Test fiber cable plants that support all three network types more quickly than conventional light sources. Universal connector lets both units connect to a variety of fiber optic connectors without expense or confusion of fixed connector units.

Proper care accessories make this the turn-key solution to remedy fiber faults. You get two two-meter 62.5/125 multimode graded-index fiber launch (patch) cables, two ST-style coupling sleeves, fiber cleaning supplies, batteries, carrying case, test data recording pad, fiber testing application notes, *Testing and Troubleshooting Guide* and quick-reference card. The 6-ounce OPM is 2.3" x 5.5" x .8"; the 4-ounce OLS is 2.3" x 4.8" x .8". One-year warranty.

8080-02 OLTS Kit

800X854	1-2,	\$1585.00 ea.;	3-up,	\$1499.00 ea.
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3M

6150A Hot Melt Termination Kit

Most Popular ST Connector Type

This versatile kit contains all the tools and materials necessary to terminate 6100 Hot Melt or 6102-H Push-Pull Hot Melt. Features of this kit include one-step polishing tools and materials plus all tools and materials required for cable preparation. It also includes a lightweight 110-V oven which is pre-set for the proper operating temperature, a cooling fixture and connector holders. In addition, 3M offers a one-step polishing machine for polishing the ferrule of any 3M Hot Melt Connector.

Offered separately are 3M's 6100, 6100R and 6100B Hot Melt ST connectors. These connectors are keyed bayonet style multimode connectors, compatible with ST Connectors, which incorporate 3M's Hot Melt adhesive technology and 3M's pre-radiused PC zirconia ceramic ferrule technology. The result is a quick mount fiber optic connector that installs faster than other adhesive connectors, delivers low light-loss, solid intermateability and mechanical stability. The 6100 connectors have been specifically designed for quick, accurate and permanent field terminations in LAN intrabuilding environments. All of the 6100 connectors accommodate a 125- μ m multimode fiber, operate at temperatures in the -40° to 60° C range and are easily identified by boot color. The 6100 has a white boot, the 6100R has a red boot, and the 6100B comes with a black boot.

Another connector option for use with the 6150A Termination Kit is the 6102-H. With no additional tools or training, this push pull connector converts from simplex to duplex quickly and easily in the field. Using two clips, the installer simply snaps the simplex connectors together to produce a duplex connector with the ferrules on 0.5-inch centers. The push-pull connector is easy to install. Its rectangular design requires less adjacent space to engage or disengage compared to connectors requiring a twisting action. The 6102-H can be actuated with the housing or boot for easy handling in dense configurations. Boot actuation makes it possible to install the connector in a recessed outlet for connector protection and a cleaner look. To aid in preventing accidental movement of the ferrule in a connection, the 6102-H has a pull-proof and side-pull-resistant design. This averts disruption of the optical signal if the cable is disturbed. Another feature of the 6102-H push-pull connector is 3M's zirconia ceramic ferrule with a proprietary PC finish to ensure low attenuation and minimize reflected power. The zirconia



ceramic ferrule provides tight hole and concentricity tolerance, and its flexural strength resists damage from impact.

Also offered for use with the 6150A are the 6110 and 6111 adaptors. Both of these couplings are compatible with Hot Melt, Bayonet and Push-Pull connectors and cable assemblies. Model 6110 features a threaded coupling with a PAL nut while the 6111 has a flanged coupling. The 6150A Hot Melt Termination Kit weighs 16 pounds and has a one-year warranty.

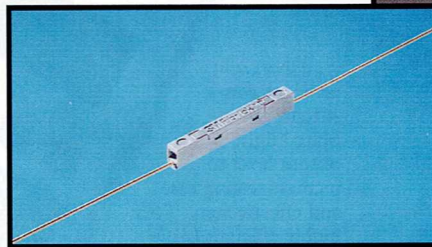
599X650	6150A Hot Melt Kit.....1-5,	\$1359.00 ea.; 6-up,	\$1290.00 ea.
599X600	6100 (White) Connector....1-9,	7.25 ea.; 10-up,	7.00 ea.
599X604	6100R (Red) Connector....1-9,	7.25 ea.; 10-up,	7.00 ea.
599X602	6100B (Black) Connector..1-9,	7.25 ea.; 10-up,	7.00 ea.
599X608	6102H Connector.....1-9,	9.00 ea.; 10-up,	8.75 ea.
599X610	6110 Adaptor.....1-9,	5.00 ea.; 10-up,	4.75 ea.
599X611	6111 Adaptor.....1-9,	5.00 ea.; 10-up,	4.75 ea.

Fibrlok 2531 Fiber Optic Splice Kit

The Fibrlok 2531 fiber splice preparation kit provides all the tools necessary for the assembly of optical fiber splice. Termination of a splice requires only a few tools to complete cable preparation easily. The 2531 fiber splice preparation kit contains the following components: 2501 Fibrlok assembly tool, No-nik fiber stripper (0.008), Micro-strip precision stripper (0.006), Miller model 100 cable stripper, Ideal coaxial cable stripper, Clauss telecommunication snips, 20X magnifier cleaved fiber, an empty bottle for isopropyl alcohol, lint-free cloth (100 each), carrying case and manual. One-year warranty.

Fibrlok items available separately are the 2501 Fibrlok assembly tool, the 2524 optical fiber splice organizer tray and the Fibrlok II 2529 universal optical fiber splice. The 2529 was designed for splicing any combination of 250 to 900 μ coated fibers. In addition, the 2529 universal splice provides a single cleave length for 250 and 900 μ coated fibers, the ability to reposition fibers for improved splicing yield and a new compact splice package which provides individually sealed compartments for the six enclosed splices. The Fibrlok II 2529 can be used with either singlemode or multimode fibers with a glass cladding diameter of 125 μ . Six per package.

Cleave tool must be ordered separately. We recommend the economical Clauss hand-held cleaver. It leaves an end face angle of 3° or less and cleaves 125- μ m optical fiber with 200- μ m or larger buffer. Whether you choose the 2531 fiber optic splice kit with its many options or single accessories, this variety should meet all your splicing needs.



599X531	2531 Fiber Splice Kit.....1-5,	\$535.00 ea.; 6-up,	\$509.00 ea.
599X501	2501 Fibrlok Assembly Tool..1-5,	70.00 ea.; 6-up,	67.00 ea.
599X529	2529 Fiber Splice (pkg. 6)....1-5,	60.00 ea.; 6-up,	57.00 ea.
024X025	CC125 Cleave Tool.....1-5,	225.00 ea.; 6-up,	214.00 ea.
599X524	2524 Organizer Tray.....1-5,	34.00 ea.	

NEXT-DAY DELIVERY
ONLY \$14.95!



AMP



OPTIMATE®

Fiber Optic Connector Termination Kit

- Hand tool terminates cables up to 3 mm in diameter
- Polishing materials included for 60 connectors
- Handy carrying case with organizer tray

This AMP® OPTIMATE® 2.5-mm Bayonet Termination Kit provides all the materials and tools (except epoxy) required to terminate specific fiber optic connectors. Use the included economy hand tool to terminate cables up to 3 mm in diameter. This ST style kit contains enough polishing materials for approximately 60 connectors.



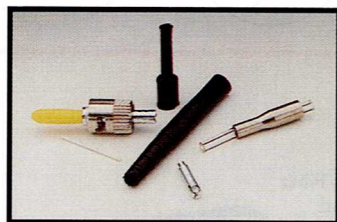
OPTIMATE tools include two No-Nik fiber strippers, scissors, fiber-optic cable jacket stripper, scribe tool and die set assembled to the black hand tool frame assembly. Supplies include two polishing bushings, polishing plate, polishing pads (green and white), polishing film (0.3 μ m, 1 μ m, 5 μ m and 15 μ m), curing sleeve, epoxy applicator, two strip cards,

water bottle, STC fiber optic connector hex die set, alcohol wipes and more.

This kit is conveniently packaged in a handy two-level gray carrying case with organizer tray, foam pad and complete instructions for each tool. The 5-pound kit measures 13.5" x 10" x 3.25". Ninety-day warranty.

194X629 503746-1 ST Style Kit.....1-2, \$737.00 ea.; 3-up, \$678.00 ea.

AMP



LightCrimp™ XTC™

No-Epoxy Fiber Connector Termination Kit

- Two-step crimp, cleave, polish termination process
- Carrying case with tray and foam pad
- Three ST style connectors optional

The LightCrimp™ XTC Kit™ includes all the preparation tools and accessories necessary to terminate Light-Crimp XTC ceramic and stainless steel no-epoxy fiber connectors. The termination process requires a two-step crimp, cleave and 30-second polish. This kit includes cable prep template, plastic and metal polishing bushings, fiber strippers, lapping film, polish pad, scissors, cleave tool, cable stripper, hand tool with die set, polish plate and 10 sheets of each polish film. All these supplies come packaged in a convenient two-level gray carrying case with tray, foam pad and instructions. The 5-pound kit is 13.5" x 10" x 3.25".

Three optional ST Style Connectors are available separately. They combine precision molding techniques and crimp-action technology. An epoxy-less termination of fiber optic cable is accomplished in under two minutes. The 504034-1 is an SST ferrule for multimode 125- μ m fiber. Order 504034-3 for the SST ferrule for multimode 140- μ m fiber. The 504000-1 is a ceramic ferrule for singlemode fiber.



194X660 503125-1 XTC Kit.....1-2, \$832.00 ea.; 3-up, \$766.00 ea.
194X684 504034-1 Connector1-9, 12.00 ea.; 10-49, 10.25 ea.
194X686 504034-3 Connector1-9, 13.50 ea.; 10-49, 11.50 ea.
194X680 504000-1 Connector1-9, 32.00 ea.; 10-49, 27.25 ea.



Model MS-FOK-1

Fiber Optic Stripping Kit

Micro-Strip tools are widely used by field installers, connector and component manufacturers plus R&D labs. Every design detail has been tested and proven in the field. These tools are specifically designed for fiber optic stripping. For accuracy, every component is manufactured to tolerances tighter than 0.0005". Micro-Strip's modular blade sets are quickly interchangeable and replaceable for coated optical fibers up to 900 μ m or jacketed fiber up to 0.140".

Reduce error and the chance of fiber damage with Micro-Strip's color-coded components. These stripping tools require less than a pound of peak force to strip coated fiber. This means less stress on the fiber and higher quality splices.



MICRO ELECTRONICS, INC.

This convenient kit includes the most used components for fiber optic stripping. Handle assembly MS-1-FS accommodates the following blade sets for stripping fiber optic buffer coating up to 900 μ m: MS1-RB-06, MS1-RB-08 and MS1-RB-10. An assortment of tube guides fits these blade sets. Handle assembly MS-2-L accommodates blade sets MS2-RB-44 and MS2-RB-54 plus tube guides MS2-RT-D1 and MS2-RT-D2. Kit comes with complete instructions, cleaning brush and push tool. To order individual tools, please contact SPC Sales Department. The 1-pound kit measures 8" x 5" x 2". Warranty covers defective parts.

MS-FOK-1 Stripping Kit

212X701.....1-5, \$229.00 ea.; 6-up, \$215.00 ea.

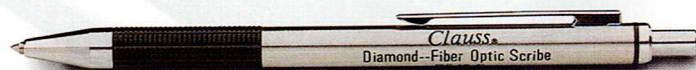


Model CC125

Fiberoptic Cleaver

Fast and easy, this revolutionary new Clauss fiberoptic cleaver features an automatic mode of operation. It is designed to leave an endface angle of 3° or less, and it will cleave 125- μ m optical fiber with a 200- μ m or larger buffer. After cleaving, the compact CC125 holds fiber for safe disposal. Factory-replaceable carbide blade yields consistent cleaves for up to 1000 uses. It offers adjustable cleave length from 0.25" to 0.75". For easy handling, Model CC125 features a plated steel handle with plastic grips. Get a perfect cleave every time with anodized aluminum cleaving blocks/fixturing and polyurethane rubber cleaving/gripping pads. The compact Clauss CC125 is a field portable 5.125" x 1.75" x 1.5".

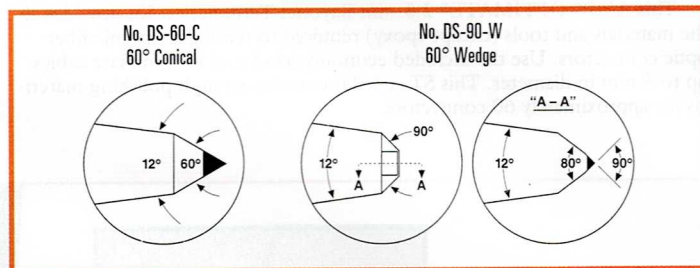
024X025 CC125 Fiberoptic Cleaver.....1-5, \$249.00 ea.; 6-up, \$225.00 ea.



Retractable Diamond-Tip Fiberoptic Scribes

High-quality fiberoptic scribes are made especially for the scratch and pull technique of scribing optical fibers. Each tool features a protective retractable barrel with pocket clip and stainless steel mounted diamond tip. Choose DS-60-C for a 60° conical shape or DS-90-W for a 90° wedge shape with a more durable edge.

024X031 DS-60-C Conical Scribe.....1-5, \$39.00 ea.; 6-up, \$35.50 ea.
024X033 DS-90-W Wedge Scribe.....1-5, 104.00 ea.; 6-up, 94.00 ea.



Fiber-Safe™ Model FS9500

Fiberoptic Safety Kit

The Fiber-Safe™ Safety Kit was developed for working safely with glass fiber. It contains Fiber Scraps Trash Can, 10 Bifurcated Swipes, Fiber Splinter Removal Tweezer, Safety Glasses and Polishing/Work Mat. Kit contents also may be purchased separately.

With its mounting base, the disposable Fiber Scraps Trash Can gives you the safest method of disposing of glass fiber scraps because it can be incinerated when full. You will appreciate the bifurcated (two-pronged) swipes that put an end to working with messy bottles of alcohol and hand wipes to clean fiber ends before splicing, cleaving or terminating fiber. The self-contained tube dispenses 99% isopropyl alcohol. Hand pressure breaks the seal, and it dispenses only when you squeeze the tube to reduce evaporation and alcohol waste. The Splinter Removal Tweezer's Teflon coating provides the cushioning you need to remove glass fiber splinters without shattering or breaking the glass.

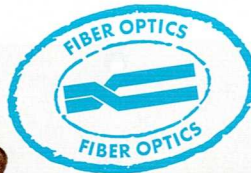
Safety Glasses always should be worn when working with fiber. The latest single-lens wraparound technology provides additional safety. The 24" x 22" black vinyl Polishing/Work Mat serves a dual purpose. Its primary function is to allow you to see fiber scraps easily instead of trying to find them on a lighter colored work surface. It also serves as your sub-surface for fiber polishing cloths. Instead of using a hard, non-giving surface, you have a resilient mat that depresses easily and allows you to pick up fibers quickly. It should provide better polishing results.

024X600 FS9500 Fiberoptic Safety Kit.....1-10, \$55.50 ea.; 11-up, \$50.00 ea.

Replacement Parts

024X620 FS200 Fiber Scraps Trash Can\$ 7.25 ea.
024X645 FS400 Bifurcated Swipes (10)2.25 ea.
024X640 FS500 Fiber Splinter Removal Tweezer.....12.50 ea.
024X635 FS300 Safety Glasses.....7.00 ea.
024X605 FS100 Polishing/Work Mat.....4.75 ea.





No-Nik® Fiberoptic Strippers

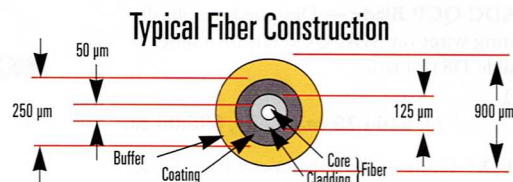
Designed by Claus, the No-Nik people, these strippers were developed expressly for stripping fiber coating off new fiber optic cables. Improper removal of buffer coating costs time and money. No-Nik Strippers let you do the job quickly while meeting the most stringent specifications. When used properly, these tools are 100% reliable. No adjustments are necessary. Just use the correct size and be assured that you will make the most precise strip possible (accurate to 5 μ m).

Plastic heads, which make contact only with the insulation, center and support your work on both sides of the cutting blades. The head-centering device centers fiber for precise buffer scoring and removal. Cutting blades made from the finest razor-quality steel completely score the insulation around the fiber. Back-up blades support cutting blades in a sandwich, nest positively and lock up when the tool is closed to maintain perfect concentricity. Cushion-grip handles are color-coded for easy identification by cutting hole sizes. The cutting blade diameter is clearly marked on the plastic head. An arrow indicates direction pressure should be applied when stripping.

Insulation being removed acts as guide and protection for the fiber user. Many fibers need no secondary cleaning after being stripped, but some primary coatings can leave residue on fiber and may require some chemical cleaning to ensure pristine surfaces.

Choose from seven common sizes of No-Nik Strippers: navy blue-handled NN102 for 102- μ m cable, silver-handled NN127 for 127 μ m, gold-handled NN152 for 152 μ m, mustard-handled NN175 for 175 μ m, red-handled NN203 for 203 μ m, light blue-handled NN254 for 254 μ m and white-handled NN305 for 305- μ m cable. If your application uses more than one size, we also offer the three-piece NN03 kit that includes NN203, NN254 and NN305.

024X082	NN102 Stripper (102 μ m).....1-9,	\$34.50 ea.;	10-up,	\$31.00 ea.
024X083	NN127 Stripper (127 μ m).....1-9,	34.50 ea.;	10-up,	31.00 ea.
024X084	NN152 Stripper (152 μ m).....1-9,	34.50 ea.;	10-up,	31.00 ea.
024X086	NN175 Stripper (175 μ m).....1-9,	34.50 ea.;	10-up,	31.00 ea.
024X085	NN203 Stripper (203 μ m).....1-9,	30.00 ea.;	10-up,	27.00 ea.
024X087	NN254 Stripper (254 μ m).....1-9,	30.00 ea.;	10-up,	27.00 ea.
024X189	NN305 Stripper (305 μ m).....1-9,	30.00 ea.;	10-up,	27.00 ea.
024X068	NN03 Three-Piece Set.....1-5,	90.50 ea.;	6-up,	81.50 ea.



F0 103-S Fiber Optic Stripper

This tool is specially designed for stripping 250-micron buffer coating from 125-micron optical fiber. The .0055-inch diameter hole and V-opening in the blade allow for accurate buffer coating removal and prevent scratching or nicking of optical fiber. All cutting surfaces are precision formed, hardened, tempered and ground — assuring precise buffer removal. Durable, cushion-grip handles are hot-dipped. The 2.5-ounce tool measures 5.375" long.

155X288 FO 103-S Fiber Optic Stripper...1-5, \$30.00 ea.; 6-up, \$27.00 ea.

Fiberoptic Crimp Tools

The Premier 80-Series Crimp Tool Frame offers the most accurate crimp compression to meet all crimp requirements with maximum comfort. Choose from six interchangeable die sets. The 28-401 triple-cavity set is for AT&T/ST or SMA fiberoptic connectors. Both 28-402 and 28-403 have .218 and .178 hex crimp cavities for Amphenol SMA connectors. The 28-404 with a .153 hex crimp cavity is for 3M/ST. Use the 28-405 for hex crimps of .151, .178 and/or .213. The 28-6020 with double hex crimp cavities (.128 and .151) is for Offit-fiberoptic connectors.

270X591	28-500 Frame.....1-5,	\$57.50 ea.;	6-up,	\$54.00 ea.
270X592	28-401 Die Set (AT & T/ST).....	37.00 ea.		
270X593	28-402 Die Set (Amphenol SMA A/B .213/.178).....	37.00 ea.		
270X594	28-403 Die Set (Amphenol SMA C/D .218/.151).....	37.00 ea.		
270X595	28-404 Die Set (3M/ST .153).....	37.00 ea.		
270X596	28-405 Die Set (3-Cavity .151/.178/.213).....	37.00 ea.		
270X598	28-406 Die Set (OFTI .128/.151).....	37.00 ea.		

Fiberoptic Positioner Kit

This Fiberoptic Positioner Kit includes Model 45-347 Fiberoptic Positioner and Model LB-1703 Fiber Viewing Scope. The convenient positioner simplifies viewing fiber ends before and after the cleaving operation. This molded positioner makes fiber alignment under a scope fast and accurate. A unique holding feature secures the fiber while allowing the user to rotate the fiber 180 degrees for thorough inspection.

The powerful scope allows the user to view the fiber accurately and thoroughly. This 100x lighted scope has a base for locating the fiber position under the scope. The positioner also may be purchased separately.

270X528	45-347 Positioner Kit.....1-5	\$110.00 ea.;	6-up,	\$103.50 ea.
270X526	LB-1703 Positioner Only.....	14.75 ea.		



Kevlar Scissors

These Kevlar Scissors are uniquely designed specifically for cutting and trimming Kevlar strength members found in fiberoptic cable.

270X523	45-348 Kevlar Scissors.....1-5,	\$14.50 ea.;	6-up,	\$13.50 ea.
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Harris Dracon

D814™

Deluxe Automatic Impact Tool

Make effortless, uniform connections with Harris Dracon's D814™ deluxe, all-in-one, telecom punch-down tool. Its adjustable impact wheel has high and low settings for any type of termination. Automatic spring mechanism provides right impact to seat and/or terminate wires. Compartment at end of tool stores extra blade.

The 10055-000 includes tool and Standard Type-66 Blade for 66-type blocks only. Set impact on high. Reversible for terminating with or without cutting. Order the versatile 10054-000 handle only and your choice of replacement

blades below to create another tool for a different terminal block. This 5-ounce tool is 1.4" x 5.9" x 1" with an 18-month warranty.

10055-000 D814 Tool with 66 Blade

350X0551-11, \$58.50 ea.; 12-up, \$55.75 ea.

10054-000 D814 Tool Only (No Blade)

350X0541-11, \$49.50 ea.; 12-up, \$47.00 ea.

10056-000 Standard Type-66 Replacement Blade Only

350X0561-11, \$17.00 ea.; 12-up, \$16.00 ea.

10176-000 AT&T Type 110/88 Replacement Blade Only

350X1001-11, \$21.00 ea.; 12-up, \$19.50 ea.



D914™

Automatic Impact Tool with Screwdriver Blade

The new D914™ automatic impact tool is the only combination impact and torque tool designed to meet wire termination requirements. Specially designed handle accommodates all D814™ blades plus the new screwdriver and adapter blades for multiple tool functions so you don't need to carry a different tool for each block or function. Simply change the blade, and you have another tool for consistent, trouble-free block connections. The versatile, convenient D914 meets all industry requirements for wiring 110, Krone, BIX and 66 blocks.

Insert handy screwdriver blade into D914 handle to create flat or Phillips-head screwdriver. Install adapter blade, and the same handle lets you use a variety of torque tool bits and sockets from your existing tool kit. Built-in hook and spudger individually fit into handle slots. Use versatile hook to trace wires from a bunch or pick one from a block. Spudger removes modules from Krone blocks without cutting or damage.

Make quick, efficient connections with less effort. Use low impact for 24- and 26-gauge wire or high impact for 22-gauge wire. Store spare blades in handle. This 5-ounce tool is 1.4" x 5.9" x 1" with 18-month warranty.

10051-150 D914 Tool with Screwdriver Blade

350X0411-11, \$62.25 ea.; 12-up, \$59.25 ea.

10051-000 D914 Tool Only (No Blade)

350X0401-11, \$54.50 ea.; 12-up, \$52.00 ea.

10056-000 Standard Type-66 Replacement Blade Only

350X0561-11, \$17.00 ea.; 12-up, \$16.00 ea.

10176-000 AT&T Type 110/88 Replacement Blade Only

350X1001-11, \$21.00 ea.; 12-up, \$19.75 ea.

350X042 10051-200 Screwdriver Blade .1-11, \$12.00 ea.; 12-up, \$11.25 ea.

350X044 10051-300 Adapter Blade.....1-11, 15.50 ea.; 12-up, 13.95 ea.

D814/D914 Replacement Blades

A. Modular Phone Jack Blade — For use on 630A modular phone jacks. This unique non-impact D814 blade uses hand pressure only.

10057-000

350X0591-11, \$18.00 ea.; 12-up, \$17.00 ea.

B. AT&T Type 110/88 Blade — Use on AT&T 110/88 hardware. This reversible D814 blade is designed for terminating with or without cutting.

10176-000

350X1001-11, \$21.00 ea.; 12-up, \$19.75 ea.

C. NEW! Krone Blade — For use on Krone system blocks. Use this blade to perform both scissor action trimming and punch-down termination in one single operation.

10565-000

350X2211-11, \$42.50 ea.; 12-up, \$39.95 ea.

D. NEW! Woodscrew Starter Punch — This blade starts screws in wood or drywall.

10645-001

350X2231-11, \$16.50 ea.; 12-up, \$15.50 ea.

E. NEW! Center Punch Blade — For making metal screw starter holes.

10436-001

350X2161-11, \$16.50 ea.; 12-up, \$15.50 ea.

F. NEW! ADC QCP Blade — Designed specifically for terminating wires on ADC QCP terminal blocks. Non-reversible D814 blade.

10165-001

350X0971-11, \$104.25 ea.; 12-up, \$98.00 ea.

G. NEW! BIX® Blade — Terminates and trims feeder cable to Northern Telecom BIX System patch block. One simple push terminates and cuts wire.

10665-000

350X2241-11, \$42.00 ea.; 12-up, \$39.50 ea.

H. NEW! 3M System D Blade — Use this specially designed D814 replacement blade with 3M's popular System D termination system.

10465-001

350X2201-11, \$61.50 ea.; 12-up, \$58.00 ea.

I. GTE Phone Mart® Blade — For GTE Phone Mart® quick-connect modular telephone hardware. Reversible for terminating with or without cutting.

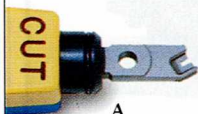
D814-PM 10058-000

350X0621-11, \$33.00 ea.; 12-up, \$31.00 ea.

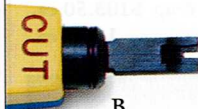
J. Standard Type-66 Blade — For use on 66-type blocks only. Set the impact on high. Reversible for terminating with or without cutting.

10056-000

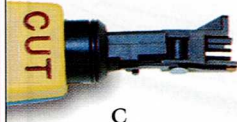
350X0561-11, \$17.00 ea.; 12-up, \$16.00 ea.



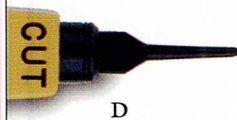
A



B



C



D



E



F



G



H



I



J



HARRIS DRACON DIVISION

DBK-814 Kit Impact Tool and Blade Kit

The DBK-814 consists of a Harris Dracon D814™ punch-down tool and six blades in one kit. Make effortless, uniform connections with the D814 deluxe, all-in-one, telecom punch-down tool. Its adjustable impact wheel has high and low settings for any type of termination. An automatic spring mechanism provides the right impact to seat and/or terminate wires. A compartment at the end of the tool stores extra blade.

This kit includes two standard type-66 blades, two AT&T Type 110/88 blades, center punch blade for making metal screw starter holes, woodscrew starter punch for use in wood or drywall and screwdriver blade. The DBK-814 comes conveniently packaged in a vinyl carrying case. It measures 8" x 4" x 2" and weighs .75 pounds.

350X960 DBK-814 Tool/Blade Kit.....1-5, \$163.50 ea.; 6-up, \$155.50 ea.



DBK-914 Kit

Impact Tool and Blade Kit

Model DBK-914 consists of a Harris Dracon D914™ punch-down tool and six blades. The D914 automatic impact tool is the only combination impact and torque tool designed to meet wire termination requirements. A specially designed handle accommodates all D814™ blades plus the new screwdriver and adapter blades for multiple tool functions, so you don't need to carry a different tool for each block or function. Simply change the blade, and you have another tool for consistent, trouble-free block connections. The versatile, convenient D914 meets all industry requirements for wiring 110, Krone, BIX and 66 blocks.

This kit includes two standard type-66 blades, two AT&T Type 110/88 blades, center punch blade for making metal screw starter holes, woodscrew starter punch for use in wood or drywall and screwdriver blade. The DBK-914 comes conveniently packaged in a vinyl carrying case. It measures 8" x 4" x 2" and weighs .75 pounds.

350X965 DBK-914 Tool/Blade Kit.....1-5, \$172.00 ea.; 6-up, \$163.50 ea.



HARRIS DRACON DIVISION

Dracon DBK-Kits

Special D814 Punch-Down Blade Kits

Our DBK-Kits are musts for telecom engineers or anyone faced with varied or high-volume telephone work. Model DBK-4 is our basic kit consisting of 66-type, 110-type, center punch and screw starter blades. The DBK-1 (not pictured) is basically the same except we've added an additional 66-type blade plus an extra 110-type blade as they are the most frequently used. Finally, our deluxe DBK-6 includes 66-type, 110-type, "BIX"-type, Krone-type, ADC QCP-type and 3M System D-type blades to handle just about any task you might face.

Each blade kit is supplied in a handy plastic storage box. All blades work with Dracon's deluxe D814 punch-down tool. Note: the punch-down tool handle does not fit inside the blade storage box. The D814 handle also may be purchased separately.

DBK-4 Basic Blade Kit

350X973.....1-5, \$72.50 ea.; 6-up, \$69.00 ea.

DBK-1 Standard Blade Kit (not pictured)

350X971.....1-5, \$108.00 ea.; 6-up, \$102.50 ea.

DBK-6 Deluxe Blade Kit

350X974.....1-5, \$289.00 ea.; 6-up, \$275.00 ea.

10054-000 D814 Handle Only

350X054.....1-11, \$47.50 ea.; 2-up, \$44.50 ea.



Model 10059-100 Power Punch™

Multi-Impact Tool

- Easy trigger activation for hours of use without fatigue
- Safely seats wires on 110-type connecting blocks
- Simultaneously terminates three-, four- and five-pair wires
- Flexible 90° rotating head keeps arm and body in proper position
- Rugged dependability for increased productivity
- Locking trigger and locking extension cord retainer

The Power Punch™ is a real breakthrough in large voice/data installations. Big jobs go five times as fast with the world's first and only power-operated multi-impact tool. If you manage big telecommunications cabling and wiring jobs or provide service to campus installations or new building construction, this tool gets the job done quickly and efficiently. Instead of pair-by-pair manual installation, tackle hundreds of repetitive telephone wire terminations with minimal effort for dependable consistency and accuracy.

This electrically operated, hand-held, combination wire insertion tool terminates three-, four- and five- pair wires simultaneously on both cable and cross-connection sides of 110-type termination blocks without cutting off leads. Also use it to seat the 110C connecting block. Trigger-activated elec-

tric solenoid action eliminates physical exertion required with other push-down impact tools. The Power Punch ensures proper and effortless termination of tough waterproof conductors at low temperatures.

High-impact housing features double insulation. Head is protected by steel encasement. No lubrication required. Standard 120 volts ac. This 2-pound tool measures 7" x 6.5" x 2". One-year warranty.

350X065 10059-100

Power Punch Tool P2014

1-5, \$359.00 ea.; 6-up, \$341.00 ea.

350X070 10059-300

Replacement Multi-Head Blade

1-5, \$104.00 ea.; 6-up, \$98.00 ea.



Weidmüller

Punch-Down Tools

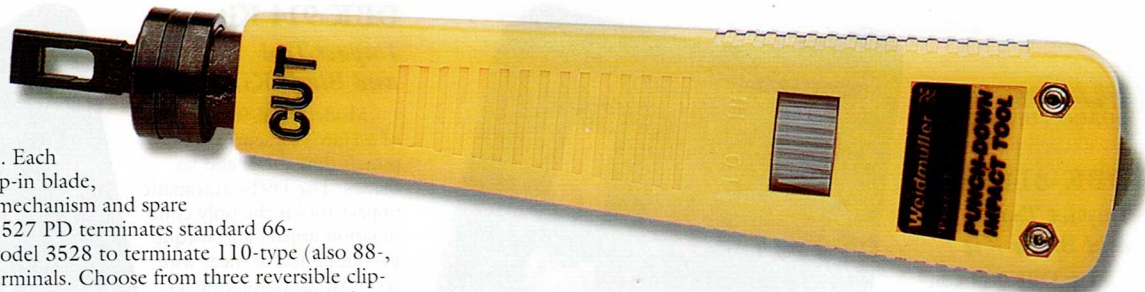
Weidmüller's punch-down tools and blades conform to AT&T performance specification. Each impact tool features reversible clip-in blade, adjustable spring-loaded impact mechanism and spare storage blade in handle. Model 3527 PD terminates standard 66-type bifurcated terminals. Use Model 3528 to terminate 110-type (also 88-, 108- and 109-type) bifurcated terminals. Choose from three reversible clip-in blades: 66-type (4527), 110-type (4528) and 603A6-type (4529) jacks. Replacement blades listed below fit these Weidmüller punch-down tools only. Each tool measures 7" x 1.4" x 1.2". One-year warranty.

Model 3527 PD Tool with 66 Blade

170X566 1-11, \$48.00 ea.; 12-up, \$43.50 ea.

Model 3528 PD Tool with 110 Blade

170X567 1-11, \$48.00 ea.; 12-up, \$43.50 ea.



Model 4527 PD 66 Blade Only

170X627 1-11, \$12.00 ea.; 12-up, \$11.00 ea.

Model 4528 PD 110 Blade Only

170X628 1-11, \$12.00 ea.; 12-up, \$11.00 ea.

Model 4529 PD 630 Blade Only

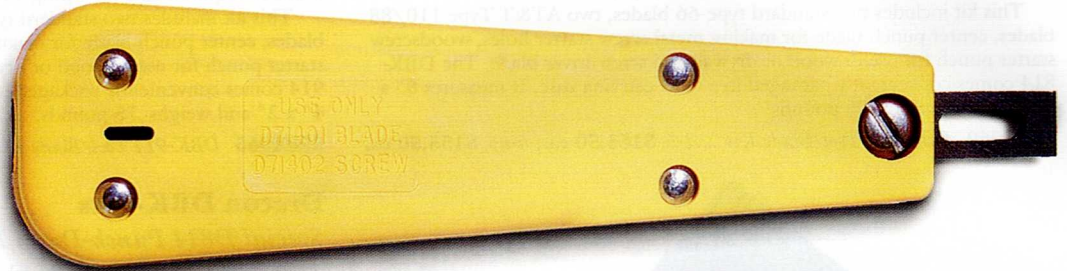
170X629 1-11, \$12.00 ea.; 12-up, \$11.00 ea.

HARRIS DRACON DIVISION

D714 Standard Automatic Impact Tool

Harris Dracon's D714 Automatic Impact Tool has been the industry standard termination tool for 66-type terminals for over 20 years. With a single push, the spring-loaded mechanism triggers the blade at the right point to seat and cut the wire to size. Adjustable impact assures termination and cuts various insulation thicknesses.

This punch-down tool comes with a reversible Standard 66 Blade. One end terminates and cuts; the other terminates only. AT&T 110-Type Blade is also available. Replacement blades listed below fit the D714 tool only. The 5-ounce tool is 1.4" x 5.9" x 1". It has an 18-month warranty.



71400-000 D714 Tool with 66 Blade

350X950 1-11, \$34.50 ea.; 12-up, \$33.00 ea.

71401-000 Replacement 66-Type Blade

350X955 1-11, \$16.50 ea.; 12-up, \$15.75 ea.

71401-110 Replacement 110-Type Blade

350X958 1-11, \$17.50 ea.; 12-up, \$16.50 ea.



Punch-Down Tools

Ideal's new Punch-Down Tools feature an adjustable impact wheel with high and low settings for any type of termination. An automatic spring mechanism provides the right impact to seat and/or terminate wires.

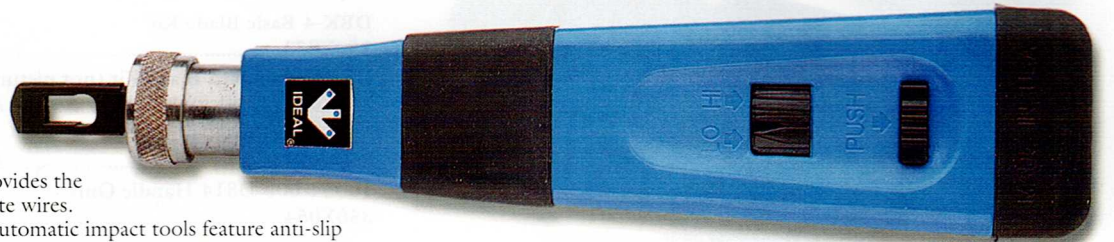
These versatile and convenient automatic impact tools feature anti-slip grip and blade storage in base. They meet all industry requirements for wiring AT&T, Krone, BIX, 66 and 110 block specifications. Choose from 66- and 110-type models. Replacement blades listed below fit these Ideal tools only. Each 7-ounce tool measures 1.4" x 5.9" x 1". One-year warranty.

35-488 Punch-Down Tool with 66 Blade

370X115 1-11, \$49.95 ea.; 12-up, \$46.95 ea.

35-486 Punch-Down Tool with 110 Blade

370X122 1-11, \$49.95 ea.; 12-up, \$46.95 ea.



35-484 Tool Only (No Blade)

370X110 1-11, \$34.50 ea.; 12-up, \$32.50 ea.

35-498 Replacement 66-Type Blade

370X685 1-11, \$19.50 ea.; 12-up, \$18.50 ea.

35-496 Replacement 110-Type Blade

370X690 1-11, \$19.50 ea.; 12-up, \$18.50 ea.



Five-Pair Termination Tool

Reduce 110-type LAN and telecommunication distribution system installation time. Model S788J1 is the only multi-impact tool that can be used on both cable and cross-connect sides of 110-type termination blocks. It terminates and cuts up to five pairs of UTP at the same time. This Siemon multi-punch tool is ideal for seating three-, four- and five-pair con-

necting blocks. It features reversible blades for seating conductors without cutting. Its ergonomic design provides comfortable use.

The 7-ounce Tool measures 1.2" x 5.5" x 1". One-year warranty.

S788J1 Five-Pair Termination Tool

620X320 1-5, \$139.00 ea.; 6-up, \$128.00 ea.





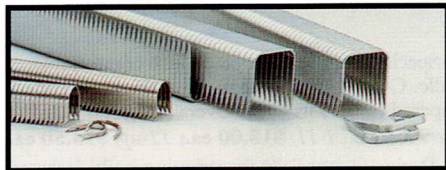
Model T-25M/T-75 Staple Guns

- All-steel construction
- Patented jam-proof mechanism
- Grooved guide
- Chrome finish

Arrow Staple Gun Tackers are the preferred tools of professional installers everywhere. They are used for fastening alarm, telephone, intercom or any other low-voltage wire. Features include grooved ejector blades that halt staple drive at a safe height to prevent wire shorts or damage, grooved staple guides for proper alignment and

T-25M Regular and Monel Staples

Stock No.	Part No.	Prices (1000/box)	
		1-9	10-up
012X027	T-25 1/32"	\$2.25	\$2.00
012X029	T-25 3/16"	2.25	2.00
012X031	T-25 7/16"	2.25	2.00
012X033	T-25 1/4"	2.50	2.25
012X037	T-25M 3/32"	10.50	9.50
012X039	T-25M 3/8"	11.00	10.00
012X041	T-25M 7/16"	11.25	10.25
012X043	T-25M 1/2"	12.50	11.25

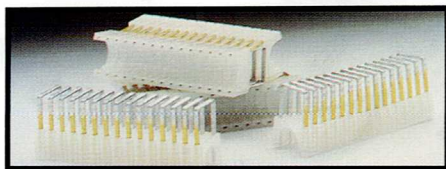


Model T-59™ Wiring Tacker

For the Pro or Do-it-Yourselfer

- Safe, speedy and efficient performance
- All-steel construction with chrome finish
- Grooved guide and driving blade
- Patented, jam-proof mechanism
- Short-span, easy-compression handle

Model T-59 is the preferred fastening tool of professional wire and cable installers in every field. It is ideal for installing telephones, TV, cable, intercoms and burglar alarm systems. Use it with plastic cable, hollow tubing, radiant heat cable and virtually any wire application.



#5911 Series Insulated Staples for Use with T-59 Wiring Tacker

Stock No.	Part No.	Color	Insulator Inner Height	Dimensions Width	For Wires up to	Prices (300/box)	
						1-9	10-up
012X500	591168	Clear	1/4" (6 mm)	1/4" (6 mm)	3/16"	\$7.50	\$6.75
012X505	591168BL	Black	1/4" (6 mm)	1/4" (6 mm)	3/16"	7.50	6.75
012X510	591188	Clear	1/4" (6 mm)	5/16" (8 mm)	1/4"	7.50	6.75
012X515	591188BL	Black	1/4" (6 mm)	5/16" (8 mm)	1/4"	7.50	6.75
012X520	591189BL	Black	5/16" (8 mm)	5/16" (8 mm)	5/16"	7.50	6.75

ETC50K™ Cordless Electro-matic Staple Gun Tacker Kit

Plug-in Power Without the Tangle of Cords

- Flush-front gets into tight corners
- Contoured design for perfect balance and tireless handling
- Solid-state electronics for rapid-fire operation
- Patented, precision-locked, jam-proof mechanism
- All-steel channel and track for dependable long life

This versatile, instant-fire cordless electric staple gun speeds up and simplifies fastening applications on the job, in the shop and around the home. An LED lights when gun is ready to fire. The on/off safety trigger lock provides fast, easy-squeeze trigger operation. An easy access door simplifies battery removal and insertion. Lightweight, high-impact housing is rugged and durable.

The Staple Gun Kit contains ETC50 Cordless Electric Staple Gun, B7200™ Rechargeable Battery Pack and CG072 7.2-Volt Battery Charger. This 7-pound kit is packaged in a 14" x 11" x 3.5" reusable blow-molded storage case. Choose from four sizes of T-50® regular and Monel rustproof staples. Optional B7200 Battery Pack features one-hour, quick-charge, 7.2-V rechargeable ni-cad battery and charger. Two-year warranty.

012X330	ETC50K Staple Gun Tacker Kit.....	1-5,	\$210.00 ea.;	6-up,	\$189.00 ea.
012X325	ETC50 Staple Gun Tacker Only.....		105.00 ea.		
012X315	B7200 Battery Pack		50.00 ea.		

T-50® Staples

Stock No.	Part No.	Prices (1250/pak)	
		1-9	10-up
012X305	T-50 3/16"	\$2.75	\$2.50
012X306	T-50 3/8"	3.25	3.00
012X308	T-50 1/2"	3.25	3.00
012X309	T-50 5/16"	3.50	3.25

T-50® Monel Rustproof Staples

Stock No.	Part No.	Prices (1250/pak)	
		1-9	10-up
012X335	T-50M 5/16"	\$12.75	\$11.50
012X336	T-50M 3/8"	15.75	13.75
012X338	T-50M 1/2"	18.00	16.25
012X339	T-50M 5/16"	20.00	18.00

durable all-metal construction. Select from two staplers plus your choice of various regular and Monel (M) rustproof staple sizes to cover a complete range of applications. *NOTE: T-25M and T-75 staples are not interchangeable.*

T-25M (1/4" Crown) Staple Gun

012X025.....1-9, \$35.00 ea.; 10-up, \$31.50 ea.

T-75 (1/2" Crown) Staple Gun

012X075.....1-9, \$35.00 ea.; 10-up, \$31.50 ea.

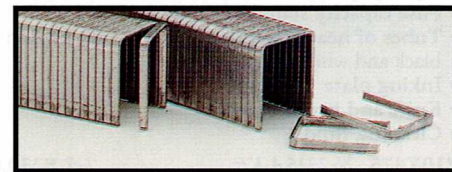
Model T-75 Regular and Monel Rustproof Staples

Stock No.	Part No.	Prices (1000/box)	
		1-9	10-up
012X077	T-75 3/16"	\$5.00	\$4.50
012X079	T-75 3/8"	5.50	5.00
012X081	T-75 7/8"	5.75	5.00
012X087	T-75M 3/16"	33.00	29.50
012X089	T-75M 3/8"	35.00	31.50
012X091	T-75M 7/8"	38.50	34.50

The exclusive design of the T-59 Staple Gun Tacker and #5911 Series Insulated Staples allows safe and secure installation of all types of wiring from 1/4" (6 mm) to 5/16" (8 mm) in diameter. This combination is designed for safer, snugger and neater fastening. Specially coated insulated staples provide triple holding power. The easy-to-load tacker holds two strips of 15 staples. Choose from five different sizes of insulated chisel-point staples with 1 1/16" (17 mm) leg length. Packed 300 per box. The staple gun weighs 2 pounds. Two-year warranty.

T-59 Wiring Tacker

012X0591-9, \$50.00 ea.; 10-up, \$45.00 ea.





Telecommunication Craft Tools

A. Bradley-Type Wire Strippers: These wire insulation strippers are designed for use with inside/outside JKT station wire and are standard hand tools carried by all telephone installers. Two slots side by side strip both IW jacket and individual conductors. Available with or without wire cutter.

Stock No.	Part No.	1-11	12-up
350X763	44200-013 22/24 AWG Regular	\$17.50	\$16.75
350X765	44200-015 24/26 AWG Regular	21.75	20.75
350X777	44210-013 22/24 AWG with Cutter	42.25	40.25
350X779	44210-015 24/26 AWG with Cutter	44.00	42.00

B. Cam Wrench Tool: A combination nutdriver and wire stripper, the cam wrench tool was designed for telephone craft work. It combines a $\frac{3}{8}$ " and $\frac{7}{16}$ " thin wall socket wrench ($\frac{1}{8}$ " deep) with a double-slot wire stripper. One slot is for the individual conductor(s), and one is for the outside jacket of a four-wire quad. Overall length is 7". Choose from three versions.

Stock No.	Part No.	1-11	12-up
350X807	44507-003 22 AWG Wrench/Stripper	\$26.25	\$25.00
350X810	44507-004 24 AWG Wrench/Stripper	26.25	25.00
350X680	44007-000 Cam Wrench only (no stripper)	12.50	12.00

C. Cable Splicers Knife: Special-purpose short blade with comfortable, full-sized, high-dielectric handle. Coping-type blade made of the finest cutlery steel, tough and carefully tempered to hold its edge. Overall length is 6.25".

060X856 44200 Cable Splicers Knife.....1-11, \$15.00 ea.; 12-up, \$13.50 ea.

D. Cable Slitting Knife: Designed especially for stripping multi-jacketed communications cables. Its unique head makes stripping both sheaths and insulations very easy. Overall length is 6"; blade is 1.5" x .75".

233X310 CS-10 Cable Slitting Knife1-11, \$21.75 ea.; 12-up, \$20.00 ea.

E. Cable Ring Tool: Designed for ring cutting the sheathing of inside type plastic-, fabric- or rubber-covered cable $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{3}{8}$ " or $\frac{1}{2}$ ".

210X600 N-2060 Cable Ring Tool.....1-11, \$24.00 ea.; 12-up, \$21.75 ea.

F. Lamp Extractor Tool: Unique and useful tool for removing miniature lamps with bayonet-type bases.

054X680 S-339 Lamp Extractor Tool.....1-11, \$9.25 ea.; 12-up, \$8.50 ea.

G. Electrician's Scissor: Designed for heavy-duty cutting of telephone wire. The upper blade has two stripping notches that will strip most insulations from 19-24 AWG.

060X557 2100-7 Electrician's Scissor1-11, \$14.00 ea.; 12-up, \$12.75 ea.

Neuses



Model N-2315A

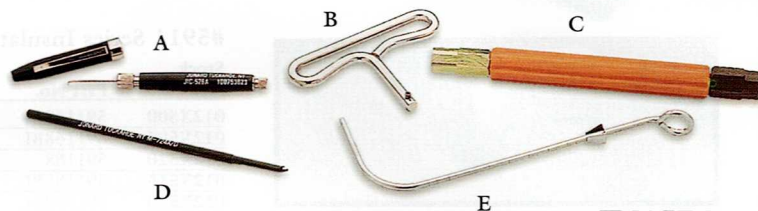
Numbering and Lettering Kit

This kit contains everything needed for permanent marking, numbering or lettering on switchboard panels, terminal boxes, sub-assemblies and chassis. It's ideal for marking cables or wire or wherever permanent, long-lasting, easy-to-read marking is required.

The N-2315A Numbering and Lettering Kit includes all of the following:

- Plastic carrying case: 16.7" (L) x 9" (W) x 9" (D)
- Peg rubber stamps: $\frac{3}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{16}$ ", $\frac{1}{8}$ " and $\frac{5}{64}$ "
- Peg stamps: A-Z letters, numbers and symbols
- Peg stamp repair sets: $\frac{3}{8}$ ", $\frac{1}{4}$ ", $\frac{3}{16}$ " and $\frac{1}{8}$ ", adhesive backed for attaching to pegs
- Fuse capacity stamps: $\frac{3}{8}$ " and $\frac{3}{16}$ "
- Tubes of heavy opaque stamping ink: English vermillion (red), yellow, black and white
- Inking plate
- Knife and brush
- Cleaning fluid

210X475 N-2315A Kit1-5, \$230.00 ea.; 6-up, \$215.00 ea.



JONARD INDUSTRIES CORP.

Telecommunications Tools

A. Key Slot Cleaner: Use this interchangeable two-in-one tool to clean and maintain various mechanical devices. Ideal for cleaning out lock key slots on coin collectors. A formed rod produced from music wire is held in place by a chuck while the other rod is stored in the pen barrel. Rod diameters are .024" and .035" thick. Tool is 4" long with cap. Thirty-day warranty.

054X446 JIC-528A Key Slot Cleaner.....1-11, \$21.00 ea.; 12-up, \$19.50 ea.

B. T Key Tool: This comfortable hand grip tool is produced from a formed metal rod containing a metal roll pin. Use it to release the housing and door locking mechanisms of No. 1A type coin telephone sets after first opening the locks with keys. Thirty-day warranty.

054X449 JIC-719A T Key Tool.....1-11, \$3.50 ea.; 12-up, \$3.25 ea.

C. Socket Wrench: The double-ended M-216C socket wrench has a $\frac{3}{8}$ " hex and a $\frac{7}{16}$ " hex. Use it to place fuses in cable terminals and to connect wires to fuses and binding posts. The walls on both sockets are thin enough to work locking devices on most terminals and cabinets. Plastic handled tool is 7" long. Thirty-day warranty.

054X545 M-216C Socket Wrench.....1-11, \$6.25 ea.; 12-up, \$5.75 ea.

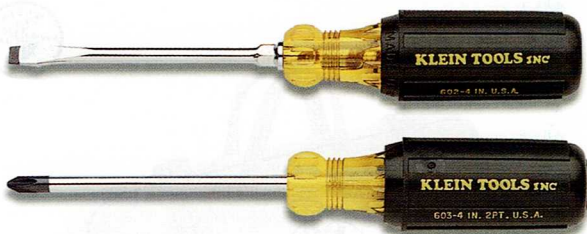
D. M-724A Wire Extractor: Metal tool with insulated handle removes wire from quick-connect clips and terminal blocks. Tool measures $\frac{3}{16}$ " in diameter and is 5.5" long with .052" slot width. Thirty-day warranty.

054X590 M-724A Wire Extractor.....1-11, \$11.25 ea.; 12-up, \$10.50 ea.

E. JIC-139B Coin Leveling Tool: Use this tool to level the coins in a coin collector when the coin receptacle becomes so full that it interferes with the collector's operation. It also may be used to measure the degree of fullness by means of a calibrated scale and metal slider. Thirty-day warranty.

054X443 JIC-139B Coin Leveling Tool ..1-11, \$21.00 ea.; 12-up, \$19.50 ea.





Cushion-Grip Screwdrivers

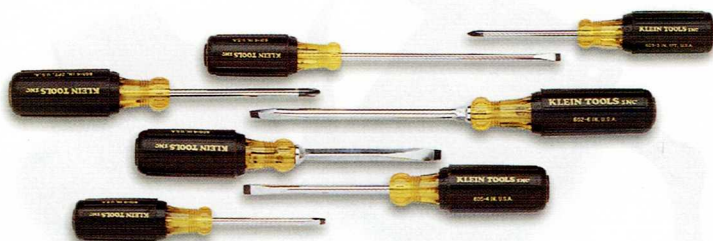
Klein Cushion-Grip Screwdrivers are the best for any job. These exceptionally strong drivers are made of carefully heat-treated, tempered steel to permit the use of 50% greater torque. A bolster on the blade at the handle provides added strength and rigidity. Blades and tips are fully chrome plated. The handle grip is super comfortable and resistant to oil, gas and water. A cushion sleeve makes the difference. This soft, black grip interlocks permanently with the slotted plastic handle. A deep-rib design and cushioning action permit the use of maximum turning power without discomfort.

Slot Screwdrivers

Stock No.	Part No.	Blade Dia. x L (Inches)	Overall L (Inches)	Price Ea.	
				1-11	12-up
060X213	601-4	3/16 x 4	7 3/4	\$6.25	\$5.75
060X214	601-6	3/16 x 6	9 3/4	6.75	6.25
060X216	601-10	3/16 x 10	13 3/4	8.00	7.25
060X220	602-4	1/4 x 4	8 11/32	7.25	6.50
060X221	602-6	3/16 x 6	10 15/16	8.50	7.75
060X223	602-10	3/8 x 10	15 7/16	13.50	12.25
060X240	605-4	1/4 x 4	8 11/21	6.75	6.00
060X242	605-6	1/4 x 6	10 11/32	7.50	6.75
060X246	605-10	1/4 x 10	14 11/32	9.50	8.75

Phillips Screwdrivers

Stock No.	Part No.	Point Size	Blade L (Inches)	Overall L (Inches)	Price Ea.	
					1-11	12-up
060X232	603-3	#1	3	6 3/4	\$6.00	\$5.50
060X233	603-4	#2	4	8 3/4	6.75	6.25
060X236	603-6	#3	6	11	9.25	8.50

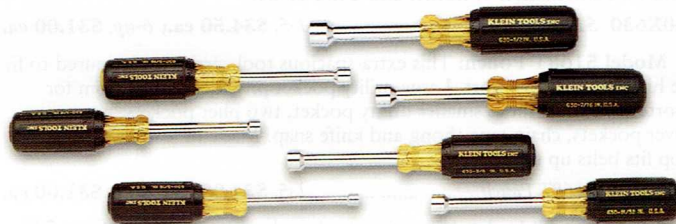


Cushion-Grip Screwdriver Sets

High-quality Klein screwdrivers feature heat-treated, tempered-steel blades with super comfortable cushion-grip handles. The seven-piece selection of popular tools includes three round-shank cabinet-tip (1/4" x 4", 3/16" x 3", 3/16" x 6"), two round-shank Phillips-tip (3", 4") plus square-shank and round-shank keystone-tip (1/4" x 4", 3/16" x 6") styles in a reclosable, seal-tight vinyl pouch. The five-piece set includes the most frequently used styles.

060X983 85076 7-Pc. Screwdriver Set...1-11, \$44.50 ea.; 12-up, \$40.00 ea.

060X982 85075 5-Pc. Screwdriver Set...1-11, 34.50 ea.; 12-up, 31.00 ea.



Cushion-Grip Nutdriver Set

The finest nutdrivers come from Klein Tools. They are rugged and solid from end to end. This seven-piece set features amber plastic handles with comfortable cushion grips. They permit the use of maximum turning power without discomfort. Handle ends are color coded for size identification. Strong hex heads drive nuts and socket screws. Recessed chrome-plated shank permits turning nuts on long screws.

060X310 631 7-Pc. Nutdriver Set.....1-11, \$37.25 ea.; 12-up, \$33.75 ea.

STANLEY



11 1/2" Chrome-Plated Push Drill

This professional-duty Stanley Push Drill features non-slip grip and all-steel construction. The handle magazine firmly holds drill bits and slides down on the shaft for easy selection. Notched drill bits will not pull out of chuck when in use. Supplied with eight drill bits: 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32" and 11/64".

087X100 03-043 Push Drill.....1-11, \$46.00 ea.; 12-up, \$42.50 ea.

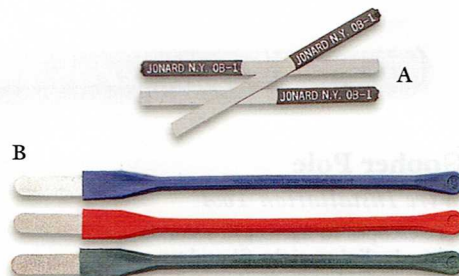


Conduit-Fitting Screwdriver

Klein's hooded-blade design keeps the tip from slipping out of screws especially when tightening overhead conduit fittings. A deep-ribbed cushion grip provides maximum turning power and comfort. The 19360 has 3/8" shank tip width with 1" shank length.

060X808 19360 Conduit Screwdriver.....1-11, \$10.00 ea.; 12-up, \$9.00 ea.

JONARD
INDUSTRIES CORP.



Burnisher Tools

A. OB-1/3 Contact Burnisher Set:

Use this three-piece economy burnisher set for fine contacts. These flexible tools are abrasive coated with plastic insulated handles for working on live contacts. Each is 3.5" long, .19" wide and .007" thick. Packaged three per vial.

054X600 OB-1/3 Three-Pc. Set1-11 \$3.50 ea.; 12-up, \$3.00 ea.

B. K234 Diamond Burnisher Kit: These three spatulas consist of abrasive diamond particles for precise cleaning of relay contacts with minimum pressure. The coarse file is .019" thick with two diamond faces and a green shaft. The medium burnisher is .017" thick with two diamond faces and a red shaft. The fine spatula is .011" thick and has a single diamond face with a blue shaft. These three 6" long files come in a rigid plastic case.

054X450 K-234 Three-Pc. Kit1-5, \$69.50 ea.; 6-up, \$62.00 ea.

C. Pocket-Type Burnisher Pen: Use this burnisher pen with six blades .007" thick for cleaning general-type relay contacts. Non-residual, abrasive, replaceable blades are stored in the pen barrel. The pen is 4 1/2" long and 3/8" in diameter. Blades are 3/16" wide and 1 1/2" long. Ball-ended rods are .020" in diameter x 1/4" long.

054X644 PB-7 Pkt. Burnisher Pen.....1-11, \$13.00 ea.; 12-up, \$12.00 ea.





Klein Leather Pouches and Belts

5164 Pouch: Features four large gusseted utility pouches, two plier pockets, two screwdriver pockets and a knife snap. Made of an exclusive combination of leather and Ultra-Hyde.

060X630 5164 Pouch1-5, **\$34.50 ea.**; 6-up, **\$31.00 ea.**

Model 5168T Pouch: This extra-spacious tool carrier is contoured to fit the hip for added comfort. Large utility pocket provides ample room for assorted tools. Includes smaller utility pocket, two plier pockets, two screwdriver pockets, chain tape thong and knife snap. Made of leather. Tunnel loop fits belts up to 2.5" wide.

060X634 5168T Pouch1-5, **\$34.00 ea.**; 6-up, **\$31.00 ea.**

5207 Belt: All-leather belts come in three lengths. M adjusts from 32" to 40", L adjusts from 38" to 46", and XL adjusts from 46" to 54". These belts will accommodate either tool pouch above.

060X650 5207-M Belt1-5, **\$18.00 ea.**; 6-up, **\$16.50 ea.**

060X651 5207-L Belt1-5, **19.50 ea.**; 6-up, **18.00 ea.**

060X652 5207-XL Belt1-5, **26.00 ea.**; 6-up, **24.00 ea.**

Canvas Bags

Standard Canvas Tool Bags: These durable bags are made of one-piece #8 white canvas covered on the bottom and 3" up the sides with Naugahyde, cemented and lock stitched. They feature protected bottoms (by steel studs), durable steel frame and harness leather handles. Each bag has two retaining straps and buckles and is 6" wide (length and depth varies). Choose from three popular sizes. These bags are a favorite in the field.

060X582 5102-14 (14" L x 14" D)1-11, **\$45.00 ea.**; 12-up, **\$40.50 ea.**

060X583 5102-18 (18" L x 14" D)1-11, **46.50 ea.**; 12-up, **42.00 ea.**

060X585 5102-24 (24" L x 15" D)1-11, **48.50 ea.**; 12-up, **44.00 ea.**

060X586 5102-S Optional Shoulder Strap Kit**22.00 ea.**



Gopher Pole

Wire Installation Tool

- Telescopes to 22 feet in seconds
- Sturdy, lightweight fiberglass
- No assembly required
- Push/pull wires over long spans

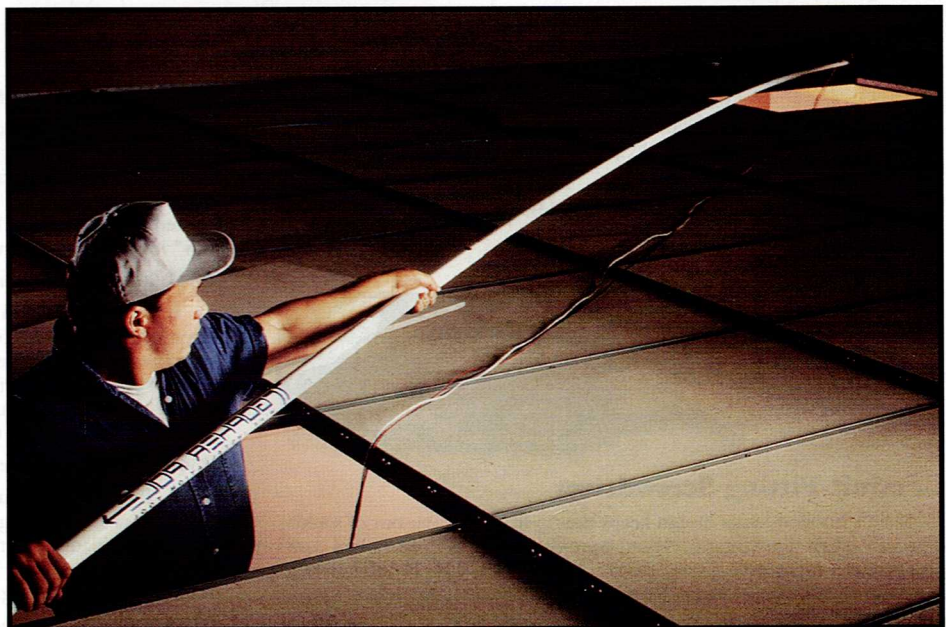
The Gopher Pole is a telescopic, fiberglass push-pull wire installation tool. Use it in suspended ceilings, limited-access areas, sub-floors, crawl spaces and attics or to fish wire over long spans. The Gopher Pole is entirely self-contained with no loose parts to lose and no sections to screw together. It collapses to 4 feet and rapidly extends to 22 feet.

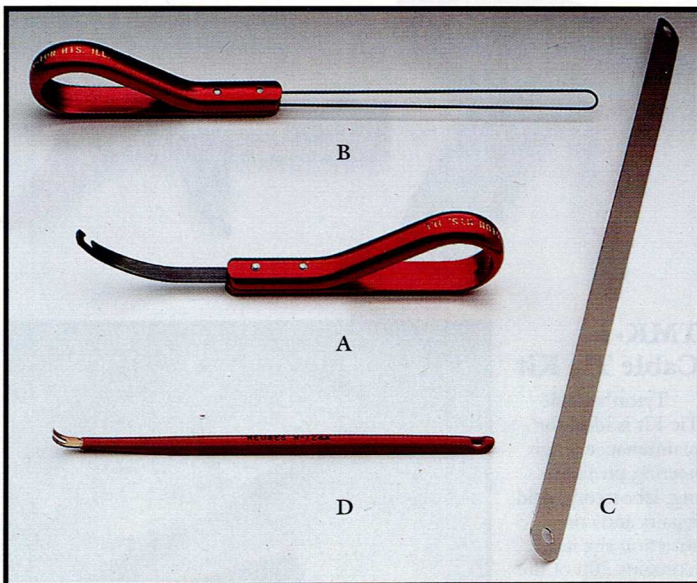
This handy tool is rigid, lightweight and easy to use. Just attach wire to eyelet on exclusive hook/skid tip or to loop in base section. Simply extend each fiberglass section until it stops. Then rotate until snap/lock button locks securely into place. Extend each additional section as needed until tip reaches the point you desire to a maximum of 22 feet.

Sturdy, safe, non-conductive tool is high-visibility white in color. The compact 4-pound unit measures 52" long x 2" in diameter. Overall length is 22'. One-year warranty.

915020 Gopher Pole

071X500 ..1-9, **\$134.00 ea.**; 10-up, **\$125.00 ea.**





Telecom Wiring Tools

A. N-287 Cable Sewing Needle — Durable, curved cable sewing needle with anodized aluminum handle is 5.63" long and weighs 1.25 ounces.

210X465 N-287 Cable Sewing Needle.....1-9, **\$11.30 ea.**; 10-up, **\$10.25 ea.**

210X467 N-287A Replacement Blades (6/pkg.).....**18.00 pkg.**

B. N-2257 Cable Lacing Needle — Long wire loop cable lacing needle with an anodized aluminum handle. It measures 8" in length and weighs 1.25 ounces.

210X471 N-2257 Cable Lacing Needle...1-9, **\$11.30 ea.**; 10-up, **\$10.25 ea.**

210X472 N-2257A Replacement Wire Loops (6/pkg.).....**12.50 pkg.**

C. N-284 Straight Metal Needle — Chicago-type straight metal needle is intended for use as a cable sewing needle. It is .16" thick.

210X463 N-284 Straight Metal Needle.....1-9, **\$6.00 ea.**; 10-up, **\$5.50 ea.**

D. N-724A Wire Removal Tool — Wire removal tool for quick-connect terminal blocks. It is an Aeco 10731-A style tool with a slot width of .050/.053 and an insulated red plastic-coated handle.

210X469 N-724A Wire Removal Tool....1-9, **\$14.00 ea.**; 10-up, **\$13.00 ea.**



Model 46037

Cable Splicer's Kit

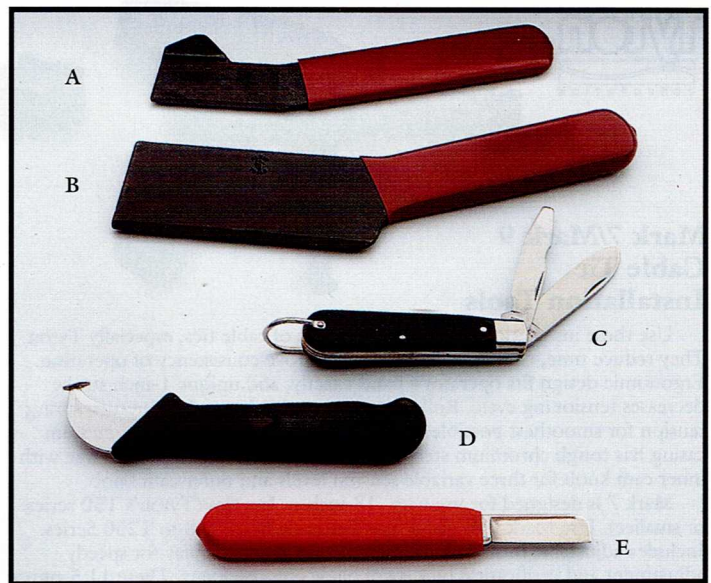
Complete, compact splicing kit includes special-purpose knife, scissors and leather holder. The 44200 Cable Splicer's Knife features a short (1.75"), tough, cutlery-steel blade and orange plastic-dipped handles. The 2100-7 Electrician's Scissor is made of strong, tempered steel with scraper and file on both sides. Features rounded points and screw hinge. One blade is serrated; the other is notched for stripping 19- and 23-gauge wire. Knife and scissor fit securely in the 5187 All-Leather Holder slotted to fit on belts to 2" wide.

060X858 46037 Complete Kit.....1-11, **\$33.50 ea.**; 12-up, **\$30.50 ea.**

060X856 44200 Knife Only.....1-11, **14.00 ea.**; 12-up, **12.75 ea.**

060X557 2100-7 Scissor Only.....1-11, **12.75 ea.**; 12-up, **11.50 ea.**

060X638 5187 Holder Only.....1-11, **7.00 ea.**; 12-up, **6.50 ea.**



Specialty Knives

A. 1515-S Cable Sheath Splitting Knife — Compact, lightweight knife for opening lead cables. Strong, carefully tempered blade of the finest cutlery steel with a sharp, chisel-shaped edge. Hammer head on back. Plastic-dipped handle. Overall length is 7.36"; blade only is 2.59".

060X536 1515-S Knife.....1-11, **\$10.00 ea.**; 12-up, **\$9.00 ea.**

B. 1515-1 Heavy-Duty Cable Sheath Splitting Knife (Bell System Type) — Big, heavy-duty knife for splitting cable sheaths. Rugged, carefully tempered, cutlery-steel blade. Keen, chisel-shaped edge. Plastic-dipped handle. Overall length is 8.75"; blade only is 4.5".

060X534 1515-1 Knife.....1-11, **\$15.25 ea.**; 12-up, **\$13.75 ea.**

C. 2800 Electrician's Knife — Standard-size electrician's knife has standard spearpoint blade 2.5" long and screwdriver-tip blade 2.5" long. Overall closed length is 3.75" long.

460X201 2800 Knife.....1-11, **\$8.00 ea.**; 12-up, **\$7.00 ea.**

D. CS-10 Cable Slitting Knife — Designed for stripping multi-jacketed communications cables. Its unique head makes stripping both sheaths and insulations very easy. Length is 6"; blade is 1.5" x .75". Made in Switzerland.

233X310 CS-10 Knife.....1-11, **\$21.75 ea.**; 12-up, **\$20.00 ea.**

E. 44200 Cable Splicer's Knife — Special-purpose short blade with comfortable, full-sized, high-dielectric handle. Coping-type blade made of the finest cutlery steel is tough and carefully tempered to hold its edge. Non-slip handle is orange plastic. Overall length is 6.25"; blade only is 1.75".

060X856 44200 Knife.....1-11, **\$15.25 ea.**; 12-up, **\$13.75 ea.**



Cable Tools

Neuses

A. N-2878 Comfort-Grip Cable Sheath Stripper — Neatly and cleanly strips the jacket from all sizes of plastic- and fabric-covered cable without damaging wire or insulation. Reverse blade for new cutting edge. Stores two Schick injector blades in handle. The 4.25-ounce tool is 6" x 3".

210X678 N-2878 Cable Stripper.....1-11, **\$32.00 ea.**; 12-up, **\$29.50 ea.**

B. N-62267 Heavy-Duty Cable Sheath Slitter — For most types of cable jackets, especially outdoor, heavy-duty sheathing. Handles large- and small-diameter cables. Razor-sharp hook safely cuts into cable at any point without notching. Extra blade included. The 2-ounce slitter is 6" x 1.5".

210X800 N-62267 Cable Slitter.....1-11, **\$19.50 ea.**; 12-up, **\$18.00 ea.**





Mark 7/Mark 9 Cable Tie Installation Tools

Use these installation tools with all makes of cable ties, especially Tyton. They reduce time, eliminate fatigue and improve consistency of operation. Ergonomic design fits operator's hand exactly, and unique 1-inch stroke decreases tensioning cycle. Roller bearing mechanism reduces return spring tension for smoothest possible stroke. Durable non-corrosive magnesium casing has tough chromium steel components. Fine tune tension range with inner cam knob for three variable tension levels and outer cam knob.

Mark 7 is designed for use with .18-inch or less ties (Tyton's T50 series or smaller). Use Mark 9 to install any Tyton tie from T18 to T250 Series. Includes adjustable flush cut-off, easy-to-read digital display for speedy adjustment and verification plus spare blade compartment. These 11.5-ounce tools are QPL listed per Mil. Std. MS-90387-1.

091X175 Mark 7-STD Cable Tool1-5, **\$120.00 ea.;** 6-up, **\$108.00 ea.**
091X190 Mark 9 Cable Tool.....1-5, **179.00 ea.;** 6-up, **170.00 ea.**

TWT-1 Tytontwyster Installation Tool

Tytontwyster features installer-controlled tensioning and cut-off for speed and efficiency. This lightweight, economical installation tool is sized to fit in your pocket. It is ideal for use with Tyton T18-T50 Series ties. Orange.

091X905 TWT-1 Cable Tool.....1-11, **\$22.00 ea.;** 12-up, **\$19.75 ea.**

TMK-1 Cable Tie Kit

Tyton's Cable Tie Kit is ideal for maintenance, engineering prototyping, laboratory, field repairs and construction site use.

Contains 300 of the most popular sizes. You get 100 each 18-pound 4-inch ties, 18-pound 5.75-inch ties and 50-pound 8-inch ties.

Includes 50 four-way adhesive mounts and Tytontwyster Installation Tool. A 10.75" x 7.2" x 1.7" polypropylene box with positive latch lid keeps items organized in separate compartments.

091X900 TMK-1 Cable-Tie Kit.....1-11, **\$62.00 ea.;** 12-up, **\$55.00 ea.**



Standard Cable Ties

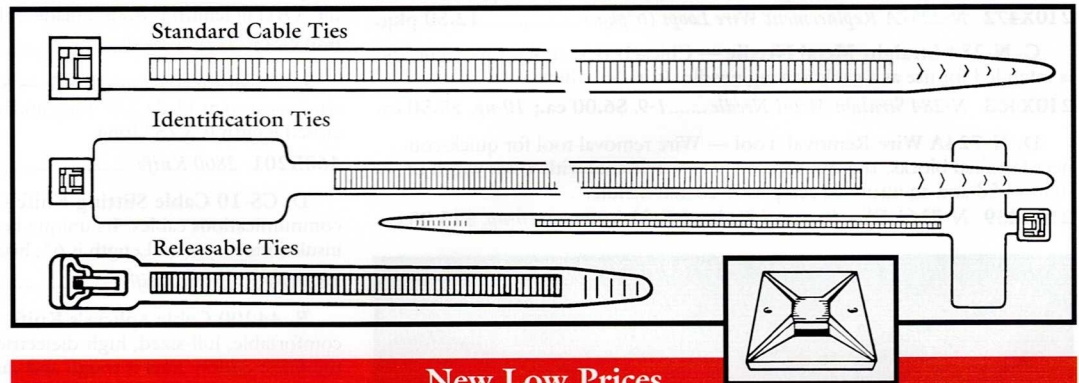
Tyton offers a complete line of patented cable ties to accommodate all your harnessing and wire/cable management needs. From the world's smallest tie (the T18S is only 3 inches long) to the extra-long 30-inch T150 lashing tie, Tyton offers a complete range of standard cable ties for most requirements. Each sturdy, long-lasting 6/6 nylon tie is serviceable to 185° F. Molded as one piece for maximum strength and reliability, every cable tie is translucent in color. Priced in packages of 1000.

Identification Ties

These ties identify wires or cables in a complex harness or cable installation. Label and tie a bundle of wires in one simple operation. A large, flat area is provided for imprinting or writing the required information. Identification Ties have the same characteristics as Standard Cable Ties described above. Packages of 100.

Releasable Ties

Non-permanent ties are popular for bundling wires or cables that may require frequent additions or subtractions. They are specially designed for use as regular ties in all respects, except they can be released and retightened as many times as necessary. Use Releasable Ties for both prototyping and servicing wires on existing harnesses and bundles. They have the same characteristics as Tyton's Standard Cable Ties above. Packages of 100.



New Low Prices

Standard Cable Ties

Part No.	Stock No.	Tensile Strength	Bundle Diameter	Length	Military Specs	Prices per Pkg./1000	
						1-9 Pkgs.	10-24 Pkgs.
T-18S	091X630	18 lbs.	1/2"	3"	N/A	\$ 9.50	\$ 8.50
T-18R	091X620	18 lbs.	3/4"	4"	MS3367-4	9.95	8.75
T-30R	091X650	30 lbs.	1 1/4"	5 1/2"	MS3367-5	24.00	21.00
T-40R	091X660	40 lbs.	1 5/8"	8 1/2"	N/A	29.00	25.00
T-50R	091X710	50 lbs.	1 3/4"	8"	MS3367-1	31.00	26.00
T-18L	091X615	18 lbs.	2"	8"	MS3367-4	20.00	18.50
T-50I	091X670	50 lbs.	3"	11 3/4"	MS3367-7	70.00	62.00
T-50L	091X680	50 lbs.	4"	15 1/2"	MS3367-2	69.00	62.00
T-120L	091X815	120 lbs.	8 3/4"	29 3/4"	MS3367-6	296.00	258.00

Identification Ties

IT-18R-C	091X120	18 lbs.	3/4"	4"	5/16" x 1 1/8"	\$ 7.50	\$ 6.50
IT-50L-C	091X153	50 lbs.	4"	15"	1/2" x 2 3/8"	21.00	18.75
IT-50R-C	091X155	50 lbs.	1 3/4"	8"	1/2" x 1 1/8"	13.00	11.50

Releasable Ties

RT40R-C	091X340	40 lbs.	2"	8 1/2"	.16"	\$ 8.75	\$ 7.75
RT50S-C	091X350	50 lbs.	1 3/8"	6 1/2"	.18"	8.00	7.25
RT50L-C	091X345	50 lbs.	2 3/4"	10"	.34"	15.75	14.00
RT50LL-C	091X347	50 lbs.	4"	15 1/2"	.18"	17.75	15.75

Mounts

MB-3A-C	091X200	3/4" square	T18-T30	\$12.00	\$10.50
MB-4A-C	091X210	1 1/8" square	T30-T50	15.50	13.00





Unwrapping Tools

Use OK Unwrapping Tools to remove solderless wrapped connections easily from 20-through 32-gauge wire.

Type D



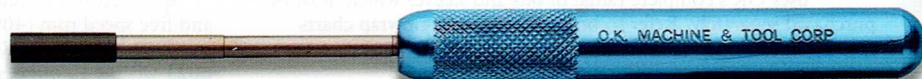
Type E



Stock No.	Part No.	Type	Wire Size AWG	Type of Unwrap	Terminal Hole		Outside Diameter Inches	Prices	
					Diameter Inches	Depth Inches		1-11	12-up
122X720	UW-2	E	20-26	Left and Right Hand	.070	1.000	.156	\$21.00	\$19.00
122X725	UW-4	D	20-26	Left Hand	.070	2.360	.187	22.00	20.00
122X780	UWD120-120	E	20-26	Left and Right Hand	.070	1.000	.120	21.00	19.00
122X775	UWD93-93	E	24-32	Left and Right Hand	.038	1.000	.093	21.00	19.00
122X770	UW-2832C	D	28-32	Left and Right Hand	.038	.750	.156	21.00	19.00

Hand Wrapping Tools

These Hand Wrapping Tools are carefully designed to produce perfect wire-wrapped connections. For use where occasional wraps are required or where power wire-wrapping tools are not practical. No special skill needed to produce dependable gas-tight connections.



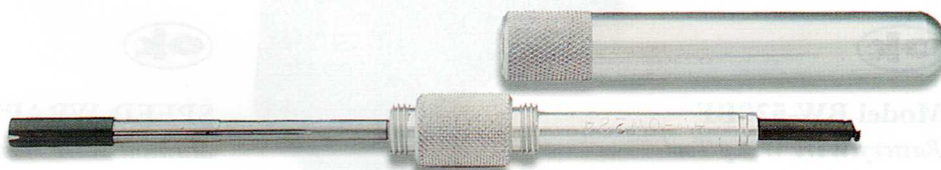
Type A

Stock No.	Part No.	Reg.	Mod.	Type	Wire Size AWG	Max Insulation Diameter Inches	Terminal Hole		Outside Diameter Inches	Prices	
							Diameter Inches	Depth Inches		1-11	12-up
122X155	HW-18-19	•		A	18-19 GA	—	.075	1.000	.250	\$60.00	\$54.00
122X250	HW-224	•		A	22-24 GA	—	.075	.807	.218	50.00	45.00
122X280	HW-2426	•		A	24-26 GA	—	.075	.750	.218	50.00	45.00
122X305	HW-3032M		•	A	30 GA	.027	.040	.750	.125	53.00	48.00

Professional Series

Reversible Wrap-Unwrap Tools

OK Industries' HW-UW Series tools have become the industry standard hand-type wire-wrapping tools. Quick and convenient to use, each unique tool does the job of two. Switching from wire wrapping to unwrapping takes only seconds — a quick change of the cap from one end to the other. This threaded cap protects the end not in use as well as serving as a handle.



Stock No.	Part No.	Wire Gauge	Type/Wrap Reg. Mod.	Max Insulation Diameter	Wrapping Terminal Hole Diameter	Side Terminal Hole Depth	Unwrapping Terminal Outside Diameter	Side Terminal Hole Diameter	Hole Depth	Outside Diameter	Prices	
											1-11	12-up
122X310	HW-UW-18-19	18-19	•	—	.075	1.00	.250	.075	1.00	.187	\$81.00	\$73.00
122X315	HW-UW-20	20	•	—	.075	1.00	.218	.070	1.00	.156	69.00	63.00
122X320	HW-UW-22	22	•	—	.075	.750	.218	.070	1.00	.156	69.00	63.00
122X345	HW-UW-224	22-24	•	—	.075	.807	.218	.070	1.00	.156	69.00	63.00
122X326	HW-UW-24SM	24	•	.044	.044	.750	.156	.038	1.00	.093	81.00	73.00
122X360	HW-UW-2426	24-26	•	—	.075	.750	.218	.070	1.00	.156	69.00	63.00
122X370	HW-UW-2829M	28-29	•	.036	.040	.750	.156	.038	1.00	.093	81.00	73.00
122X336	HW-UW-30	30	•	.027	.036	.750	.125	.038	1.00	.093	81.00	73.00
122X340	HW-UW-30MLD	30	•	.027	.066	1.00	.218	.070	1.00	.156	81.00	73.00

Standard Series

Wrap/Strip/Unwrap Tools

The WSU Series offers versatility, convenience, reliability and exceptional value for bench or tool kit use in all service and repair applications. Each portable tool wraps, unwraps and even strips the appropriate wire diameter with a unique built-in stripping blade. The WSU-26M makes a modified wrap with 26 AWG (0.40 mm) wire on .030 x 0.60" (0.76 x 1.52 mm) and .045" (1.14 mm) square posts. Model WSU-2224 is for regular wrapping with 22-24 AWG (0.65-0.50 mm) wire on the same size posts as WSU-26M. Use the WSU-30 for regular and the WSU-30M for modified wrapping with 30 AWG (0.25 mm) wire on standard .025" (0.63 mm) square posts.



Stock No.	Part No.	Wire Size		Terminal Hole Diameter		Terminal Hole Depth		Outside Diameter		Prices	
		AWG	MM	Inches	MM	Inches	MM	Inches	MM	1-11	12-up
122X930	WSU-26M	26	0.40	.075	1.90	1.50	38.1	.213	5.4	\$34.00	\$31.00
122X927	WSU-2224	22-24	0.65-0.50	.075	1.90	1.50	38.1	.213	5.4	33.00	30.00
122X925	WSU-30M	30	0.25	.036	0.91	1.50	38.1	.125	3.18	21.00	19.00
122X920	WSU-30	30	0.25	.036	0.91	1.50	38.1	.125	3.18	20.00	18.00





Model OK-21-BFU

Electric Wire Wrap/Unwrap Tool

Model OK-21-BFU performs wire wrapping with a special back-force option to prevent over-wrapping and unwrapping. An ergonomic design greatly reduces the incidence of repetitive-motion injuries. Its long handle extends below the heel of the hand to give a more balanced feel, thus reducing muscle strain.

The high-speed motor and high-torque planetary gear drive will wrap 18-30 AWG wire. With its 4200-rpm motor, the lightweight OK-21-BFU is the ideal choice for production or prototype wire wrapping. This easy-to-use tool also allows the user to perform power unwrapping. It uses OK's complete range of bits and sleeves which must be purchased separately. Refer to both the wrap and unwrap charts below. This 11-ounce tool comes with a one-year warranty.

OK-21-BFU Wrap/Unwrap Tool

122X070 1-5, \$179.00 ea.; 6-up, \$161.00 ea.

Unwrap Bit and Sleeve Combinations

Intended for use with the OK-21-BFU only.

Bit Part No.	Bit Stock No.	Price	Wire Gauge	Sleeve Part No.	Sleeve Stock No.	Price	Terminal Hole Diameter
2026-UB	122X002	\$27.00	20-26	SOK-2230	122X683	\$15.00	.070
2832-UB	122X003	30.00	26-32	SOK-2230	122X683	15.00	.038



Model BW-520BF

Battery Wire Wrap Tool

Model BW-520BF is a battery-operated wire wrapping tool. This is an exceptionally useful tool for installation or field service work. It also includes a special back force device to prevent over-wrapping. Bits and sleeves must be purchased separately. Refer to the chart below.

122X040 BW-520BF Tool
1-5, \$245.00 ea.
6-up, 219.00 ea.

122X015 BC-31 Battery Charger \$39.00 ea.
122X640 RB-20 Repl. Batteries 28.00 ea.



Model 6021

Electric Wire Wrapping Tool

This wire wrapping tool is designed for production applications where wire sizes from 18- to 32-AWG are used. Model 6021 combines fast operation and ease of handling. Complete with a light-pull trigger and a high-speed motor (4000 rpm), it represents the highest standard in the industry.

Other features include geared drive and positive indexing mechanism. The 6021 is made from lightweight Lexan and fully insulated. The handle design greatly reduces problems normally experienced in repetitive motion injuries such as Carpal Tunnel Syndrome. No special tools are required for maintenance.

Specifications include voltage (115), cord (3W) and free speed rpm (4000). Bits and sleeves must be purchased separately. Refer to the chart below. The 6021 weighs 12 ounces. One-year warranty.

126X400 6021 Electric Wire Wrap Gun 1-5, \$239.00; 6-up, \$225.00 ea.



SPEED-WRAP® Tools

Manual Wire Wrap Guns

OK's manual wire wrap guns feature all-steel working parts to ensure long life and trouble-free service. Each professional-quality tool is designed with a chuck nosepiece to make use of the full selection of bits and sleeves made for power tools. You can produce wire-wrapped connections merely by squeezing the trigger. Each squeeze provides 10 revolutions of the bit.

Choose from two SPEED-WRAP® Tools. Model G100/R3278 is made of aluminum. The housing on the G-200/R3278 is made of very durable, high-impact Lexan® material. Bits and sleeves must be purchased separately. Refer to the chart below.

122X110 G100/R3278 Tool 1-5, \$117.00 ea.; 6-up, \$106.00 ea.
122X115 G200/R3278 Tool (Lexan) .. 1-5, 84.50 ea.; 6-up, 76.50 ea.



Wire Wrap Bit and Sleeve Selection

For use with all tools above.

Bit Part No.	Bit Stock No.	Price	Modified Wrap	Wire Gauge	Sleeve Part No.	Sleeve Stock No.	Price	Max Insulation Diameter	Terminal Hole Depth	Terminal Hole Dia.
KB2075	122X460	\$38.00		20-22	P2224	122X598	\$14.00	—	1.000	.075
KB22	122X404	38.00		22	P2224	122X598	14.00	—	.750	.075
KB224	122X424	30.00		22-24	P2224	122X598	14.00	—	.800	.075
KB24	122X410	34.00		24	P2426	122X600	14.00	—	.750	.075
WB24SM	122X858	42.00	•	24	P3032LN	122X620	25.00	.044	.750	.044
WB2426M	122X895	42.00	•	24-26	P2224	122X598	14.00	.046	.750	.075
KB26	122X417	38.00		26	P2426	122X600	14.00	—	1.000	.075
WB2644M	122X900	42.00	•	26	P3032LN	122X620	25.00	.046	.750	.044
WB28SHM	122X875	40.00	•	28	P3032	122X610	23.00	.030	.750	.036
WB30MLD	122X880	46.00	•	30	P3032L	122X619	25.00	.036	.750	.040
KB3032	122X485	48.00		30-32	P2426	122X600	14.00	.027	1.000	.066

Extra-Long Bits and Sleeves

These bits and sleeves are designed for wire wrapping in areas requiring deep penetration. The 5" length ensures true connections in hard-to-reach locations.

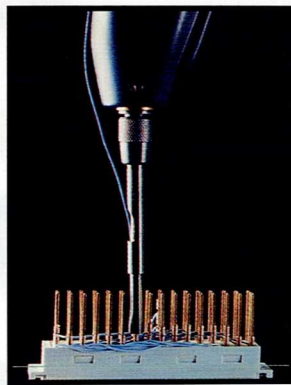
KB24-5	122X416	\$60.00		24	P2426-5	122X605	\$27.00	—	.750	.075
KB26-5	122X418	60.00		26	P2426-5	122X605	27.00	—	.750	.075





Cut-Strip-Wrap Bit and Sleeve Sets

CSW Series bit and sleeve sets make reliable wire-wrapping connections directly from cable, wire harness or reel without pre-cutting and pre-stripping. Cut off excess wire, strip proper length of insulation and wrap correct number of turns all in one automatic operation. Insert insulated wire into bit and sleeve. Place tool over terminal to be wrapped. Excess wire is cut off as tool starts to wrap. Easy front loading like standard bits. For use with industrial wire-wrapping tools. Choose from three wire sizes. **NOTE: For use with OK Kynar™ wire only — see selection at right.**



Stock No.	Part No.	Wire Size	Type Wrap	Prices	
				1-11	12-up
122X054	CSW30M-3619	30 AWG	Regular	\$224.00	\$202.00
122X050	CSW26-7026	26 AWG	Regular	224.00	202.00
122X048	CSW24-7035	24 AWG	Modified	224.00	202.00

WWK-1 Telecom Wire Wrap Kit

This is a complete field service telecom installation wire wrap tool kit. The G200/R3278 Manual Wire Wrap Gun with Lexan Housing produces wire-wrapped connection merely by squeezing the trigger. Use the ST-100 22-24 AWG Wire Cut-and-Strip Tool for easy, clean wire stripping with 1 5/16"-1 1/8" adjustable strip-off length. Place up to four wires in the stripping slot with ends extending beyond the cutter blades, press the tool and pull.

The handy HW-UW-224 Hand Wrap-Unwrap Tool (22-24 AWG) does the work of two tools in one just by changing the cap from one end to the other. This kit comes complete with KB224 22-24 AWG bit, P2224 22-24 AWG sleeve and H250 leather tool holster.

122X945 WWK-1 Wire Wrap Kit.....1-5, \$262.00 ea.; 6-up, \$236.00 ea.

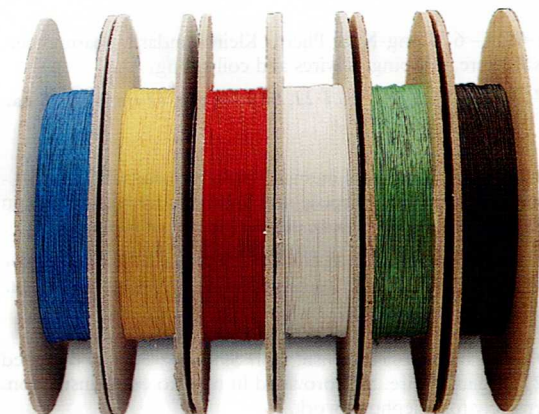


Kynar™ Insulated Silver-Plated Copper Conductor

Kynar™ is constructed of PVDF insulation and silver-plated oxygen-free high-conductivity conductor in accordance with ASTM B-170 Grade 2 and ASTM B-298 Class B. DC resistance maximum ohms per 1000' at 20° C is 26.2 Ω for 24 AWG, 41.9 Ω for 26 AWG and 106 Ω for 30 AWG. Specifications include temperature rating: 105° C; voltage rating: CSA 150 V rms; insulation tensile strength: 4500 psi minimum; insulation elongation: 100-450% @ 20 IPM; insulation concentricity: 70% minimum; spark test: 2 V rms; curl: 10" minimum diameter on 30". Choose from three colors in three wire sizes of 100-foot rolls.



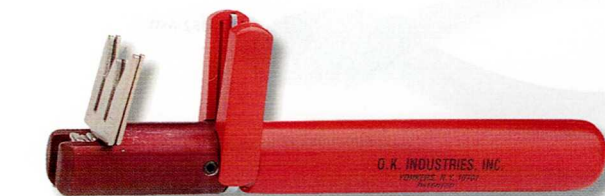
Wire Size	Stock Numbers by Color:			Prices	
	Blue	Yellow	White	1-5	6-up
24 AWG	123X200	123X220	123X215	\$17.00	\$16.00
26 AWG	123X230	123X250	123X245	14.00	13.00
30 AWG	123X290	123X310	123X305	11.00	10.00



30-AWG and 24-AWG Bulk Wire

Bulk 30-AWG and 24-AWG wire-wrap on 100-foot spools in six colors.

Gauge	Stock Numbers by Color:						Price Each
	Blue	Yellow	Red	White	Green	Black	
30 AWG	244X010	244X030	244X020	244X040	244X050	244X060	\$39.00
24 AWG	244X210	244X230	244X220	244X240	244X250	244X260	73.00



ST-100 Series Wire Cut-and-Strip Tools

Here's a revolutionary method of easy, clean wire stripping for wire-wrapping, electronic and appliance applications. Easy-to-use Wire Cut-and-Strip Tools are biomechanically designed for maximum efficiency. Place up to four wires in stripping slot with ends extending beyond cutter blades, press tool and pull. Wire is cut and stripped to the proper wire-wrapping length. Hardened steel blades and sturdy tool construction ensure long life. Easily adjust strip length for your application. Choose from four models.

Stock No.	Part No.	Wire Gauge Size	Adjustable Strip-Off Length	Prices	
				1-11	12-up
122X689	ST-100-22	22	1 5/16" - 1 1/8"	\$27.00	\$25.00
122X685	ST-100	22-24	1 5/16" - 1 1/8"	27.00	25.00
122X693	ST-100-26	26	1 5/16" - 1 1/8"	27.00	25.00
122X699	ST-100-30	30	7/8" - 1 1/8"	31.00	28.00



OK-3907 Series Wire Cut-and-Strip Tools

These OK tools are easy to operate. Just place the wires in the stripping slot with the ends between the cutting blades. Then squeeze the tool and pull. Wire is cut and stripped to the proper wire-wrapping length. The plastic grips and a soft rubber sleeve assure maximum handling comfort and slip-free gripping. Stripping blades are easily replaceable. Each nickel-plated tool has a rust-resistant finish. The OK-3909 Series tools are not applicable for Mylene or Teflon insulation. Choose from five models.

Stock No.	Part No.	Wire Gauge Size	Adjustable Strip-Off Length	Prices	
				1-11	12-up
122X542	OK-3907-22	22	1 1/2" - 1 3/4"	\$28.00	\$26.00
122X540	OK-3907	22-24	1 1/2" - 1 3/4"	28.00	26.00
122X543	OK-3907-24	24	1 1/2" - 1 3/4"	28.00	26.00
122X545	OK-3907-26	26	1 1/2" - 1 3/4"	28.00	26.00
122X547	OK-3907-30	30	7/8" - 1 1/8"	28.00	26.00





Telecom-Type Pliers/Cutters

D203-8NCR — Heavy-Duty $8\frac{5}{8}$ " Long-Nose Plier has side cutters, skinning hole for No. 12 B&S insulated wire and crimping die for connectors, lugs and terminals. D203-5C and D203-7C have $\frac{1}{16}$ " points and coil springs. All models have comfortable plastic-dipped handles.

060X026 D203-8NCR1-11, **\$29.50 ea.**; 12-up, **\$27.00 ea.**
060X019 D203-5C1-11, **18.25 ea.**; 12-up, **16.50 ea.**
060X024 D203-7C1-11, **19.00 ea.**; 12-up, **17.25 ea.**

D203-6C — Standard 6" Long-Nose Plier with side cutters permits wrapping, looping and cutting. Coil spring is standard.

060X020 D203-6C1-11, **\$18.50 ea.**; 12-up, **\$16.75 ea.**

D213-9NE — High-Leverage Type 9" Lineman's Plier features smooth, streamlined nose with knurled jaws. Our most popular.

060X038 D213-9NE1-11, **\$23.75 ea.**; 12-up, **\$21.50 ea.**

D301-6C — 6" Long-Nose Plier is Klein standard. Features serrated jaws for sure, gripping of wires and coil spring.

060X077 D301-6C1-11, **\$15.75 ea.**; 12-up, **\$14.25 ea.**

D201-7NE — Standard Lineman's Plier is original Klein NE-type side-cutter for general-purpose use. Smooth, streamlined design with plastic-dipped handles slides easily in and out of tool pouch.

060X010 D201-7NE (7")1-11, **\$23.75 ea.**; 12-up, **\$21.50 ea.**
060X013 D201-9NE (9")1-11, **25.75 ea.**; 12-up, **23.25 ea.**

D2291 — Long-Nose 6" Insulation Skinning Plier is designed to skin 22/24 gauge wire. Slot provided in nose to crush insulation. Used extensively for telephone work.

060X558 D22911-11, **\$19.75 ea.**; 12-up, **\$18.00 ea.**

D202-5C — Standard Diagonal-Cutting Plier features tapered nose, standard-bevel cutting blades and coil spring. A premium quality design with rugged precision construction and comfortable plastic dipped handles.

060X016 D202-5C (5")1-11, **\$18.50 ea.**; 12-up, **\$16.75 ea.**
060X018 D202-6C (6")1-11, **18.00 ea.**; 12-up, **16.25 ea.**

D252-6SW — Bell System Type 6" Diagonal Cutter with .052" skinning hole and "w" stripping notches to slit insulation.

060X065 D252-6SW1-11, **\$19.25 ea.**; 12-up, **\$17.50 ea.**

D228-8 — High-Leverage 8" Diagonal Cutter provides 36% greater mechanical cutting and gripping advantage than regular 8" heavy-duty diagonal cutters. Standard-bevel cutting knives and hand-form style plastic-dipped handles.

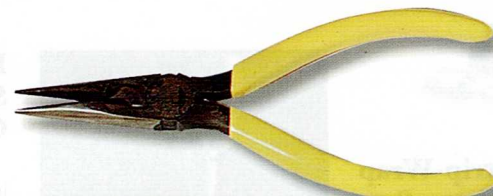
060X052 D228-81-11, **\$18.50 ea.**; 12-up, **\$16.75 ea.**

D234-6C — Specially designed 6" Plier is used for seating UG, UR and UY connectors. Stop behind cutout prevents damage to connectors. Coil spring is standard.

060X057 D234-6C1-11, **\$21.00 ea.**; 12-up, **\$19.00 ea.**

D528-V — Bell System Type 5" Diagonal Cutter with "w" notches in nose to slit insulation and with "v" notch at hinge to crush insulation.

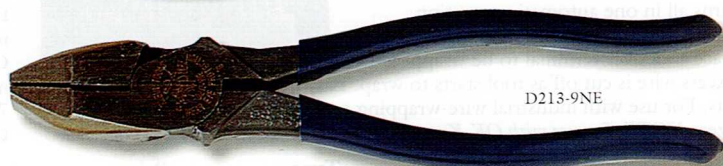
060X201 D528-V1-11, **\$19.50 ea.**; 12-up, **\$17.75 ea.**



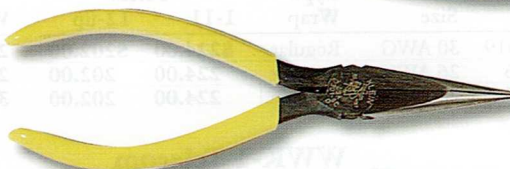
D203-6C



D203-8NCR



D213-9NE



D301-6C



D201-7NE



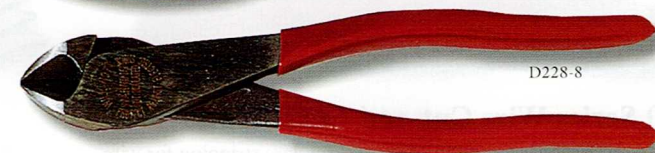
D2291



D202-5C



D252-6SW



D228-8



D234-6C



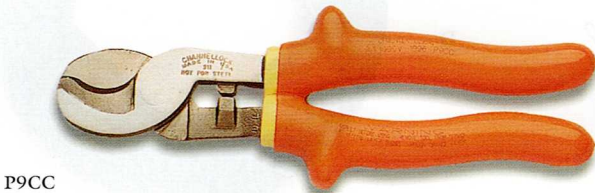
D528V



Safety Tools

Double insulated safety tools from Cementex are designed for use in potentially hazardous electrical work environments. Impact-resistant and flame-retardant insulation provides protection against flashover shock, burns and dropped tool shorts. Use these insulated screwdrivers and pliers as secondary protection. They are not meant to be used in place of the user's personal protective equipment. Whenever possible, de-energize lines and equipment prior to working on or around them.

Cementex insulated tools are tested to 10,000 V ac and rated for 1000 V ac live line use. They are marked with the international 1000-volt symbol. Cementex insulated tools comply with the IEC 900 standard for insulated hand tools and the ASTM F-1505 standard for insulated hand held tools. They help you meet the OSHA requirements in their safe work place practice standard: 29CFR1910.269, 29CFR1910.333 (b) and 29CFR1910.335 (a) (2). Choose from a selection of screwdrivers and pliers. Lifetime warranty on mechanical parts; one-year guarantee on insulation.



P9CC



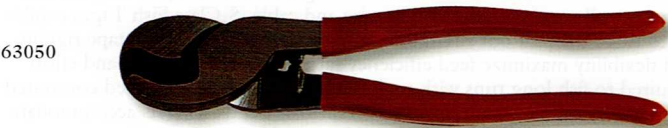
P8SJ



P6D



P6CN



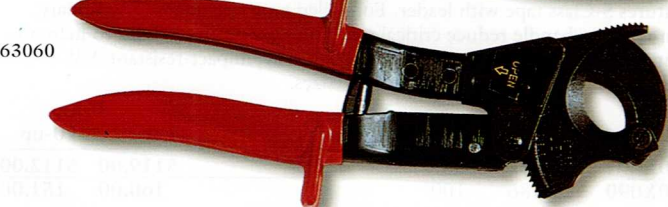
63050



63050-INS



63055

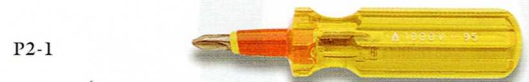


63060

CEMENTEX



Y3



P2-1

Insulated Screwdrivers

Professional screwdrivers feature flair-tip heavy-duty blades that are heat treated over entire length. Tips are ground and tapered for precise fit. Large amber handles are shock resistant and designed for maximum user comfort.

Phillips head models are precision ground to assure proper fit and reduce slippage. Heat treated over entire length.

Stock No.	Part No.	Description	Blade Tip Width	Point Size	Shank Length	Prices 1-11	Prices 12-up
278X900	Y1	Screwdriver	7/32"		1 3/4"	\$10.50	\$ 9.50
278X902	Y3	Screwdriver	7/32"		3 1/4"	10.75	9.75
278X904	Y4	Screwdriver	1/4"		4 1/2"	11.00	10.00
278X906	Y6	Screwdriver	5/16"		6"	11.75	10.75
278X908	Y8	Screwdriver	3/8"		8"	12.50	11.25
278X610	P1-3	Phillips Head		#1	3"	11.00	10.00
278X612	P2-1	Phillips Head		#2	1 1/2"	10.00	9.00
278X614	P2-4	Phillips Head		#2	4"	11.00	10.00
278X618	P2-8	Phillips Head		#2	8"	11.50	10.50

Insulated Pliers

P9CC — 9 1/2" Cable Cutting Plier is a high-leverage tool with shear-type jaws. Cuts 4/0 aluminum and up to 2/0 soft copper.

278X636 P9CC Cable Cutting Plier.....1-5, \$43.50 ea.; 6-up, \$39.50 ea.

P8SJ — 8" Slip Joint Plier has milled teeth and jaws to provide positive gripping on a wide variety of objects.

278X634 P8SJ Slip Joint Plier.....1-5, \$32.00 ea.; 6-up, \$29.00 ea.

P6D — 6" Diagonal Plier is a heavy-duty cutter for thicker gauge wire.

278X632 P6D Diagonal Cutting Plier.....1-5, \$29.00 ea.; 6-up, \$26.50 ea.

P6CN — 6" Needle Nose Plier is perfect for looping, cutting and forming wire. Cutting edges are induction hardened for longer life.

278X630 P6-CN Needle Nose Plier.....1-5, \$29.50 ea.; 6-up, \$27.00 ea.

Standard Cable Cutters

63050 — High-Leverage 9 1/2" Cable Cutter cuts most cable with ease. Special high-leverage design gives it amazing cutting capability for its size. Cable gripping, shear-type jaws cut up to 4/0 aluminum (NOT ACSR), 2/0 soft copper and 100-pair/24-gauge communication cable.

060X870 63050.....1-11, \$24.25 ea.; 12-up, \$22.00 ea.

63050-INS — Insulated High-Leverage 9 1/2" Cable Cutter provides excellent cutting capability for its size to handle most jobs with ease. Cable-gripping, shear-type jaws cut up to 4/0 aluminum (not ACSR), 2/0 soft copper and 100-pair 24-gauge communication cable. Compact design for easy portability and working in confined spaces.

060X869 63050-INS.....1-11, \$51.50 ea.; 12-up, \$46.50 ea.

63055 — Compact 8" Cable Cutter features precise, one-hand shearing action for cutting copper and aluminum multi-strand cable up to pair/24-gauge telephone cable (NOT ACSR). Special shear angle cuts clean without compression or causing frayed ends. Almost identical to the very popular Benner-Nawman Inc. cable cutter used throughout the industry.

060X871 63055.....1-11, \$29.50 ea.; 12-up, \$26.50 ea.

63060 — Ratcheting 10" Cable Cutter holds cable tightly between movable and fixed blades. Makes rapid straight cuts with minimal effort. Cuts copper up to 350 mm plus aluminum and multi-conductor cables up to 400 mm. Large, finger-formed handles have limit guards and red plastic covering. Hold-open spring with quick-release lever locks in closed position.

060X873 63060.....1-5, \$196.00 ea.; 6-up, \$177.00 ea.





Ideal Fish Tapes

Ideal offers an extensive line of quality fish tapes. Proven performers for more than 50 years, they range from spring-steel rectangular wire for maximum strength to highly flexible wound-wire Gold-Fish® tape for multi-plane bends. Preformed loops or pulling eyelets eliminate the possibility of breakage when forming loops in the field. Select from styles with reels, counters and winders to fit your needs. Choose from five types in a variety of sizes.

A. Standard Fish Tapes with Steel Reels

These general-purpose models are perfect for building construction and industrial work. Metal reels serve as handles to give firm grips for pulling on fish tapes. They eliminate special pullers and dangerous bare-hand pulling. When not in use, reels store and protect tape which cannot spring free. Choose from 50', 100' and 200' lengths.

Stock No.	Part No.	Tape Length and Size	Reel Diameter	Prices	
				1-9	10-up
370X050	31-007	50' x .13" x .045"	7"	\$22.00	\$20.75
370X055	31-011	100' x .25" x .060"	12"	53.00	50.00
370X058	31-016	200' x .13" x .060"	12"	59.00	55.50

B. Deluxe Tape-Pak™ Fish Tapes with Footage Counters

No more marking, measuring, counting or guessing. These models save time when working with multiple conduit bends, blind raceways, concealed, blocked and long conduit runs. Easy-to-read counters with magnified, clear numbers provide good visibility even with poor lighting. Counter wheels are recessed to prevent accidental stalls or slips and can be reset easily. Tested for ±2% accuracy, they never measure too short. Ruggedly built, fabricated of tough, high-impact plastic, they never rust or dent and are not affected by heat or humidity. Tape-Pak models include built-in winder and tempered spring steel tape. Choose from 100' and 200' sizes.

Stock No.	Part No.	Tape Length and Size	Reel Diameter	Prices	
				1-9	10-up
370X066	31-126	100' x .13" x .060"	12"	\$64.00	\$60.25
370X067	31-127	200' x .13" x .060"	12"	78.00	73.50

C. Gold-Fish® Fish Tapes with Reels and Winders

These highly-flexible, wound-wire, metallic fish tapes are designed for multi-bend applications. Since their inception in the early 1980s, they have become the industry standard by which all other multi-bend pulling tapes are measured! They are constructed of .19" diameter multi-stranded steel wire with plate-steel pulling eyes on each end. They bend in all directions and will not jam or back up. Each Gold-Fish® Tape has 500-pound working strength, bright brass finish that resists corrosion and convenient Tape-Pak™ reel and winder. Choose from 50' and 75' lengths.

Stock No.	Part No.	Tape Length and Size	Reel Diameter	Prices	
				1-9	10-up
370X072	31-144	50' x .19"	12"	\$ 73.00	\$67.00
370X074	31-145	75' x .19"	12"	100.00	94.00

D. S-Class™ Fish Tapes with Reels and Winders

S-Class Fish Tapes come in Tape-Pak® reels with winders. Reinforced non-conductive fiberglass cores with outer nylon coatings are specially designed for working around energized panels, circuitry and telecommunications installations. And because they feature cleaner tapes, they are perfectly suited for use in office environments. Designed to reduce jamming and friction in small conduit with existing wire and cable, S-Class Fish Tapes exhibit up to twice the pull-out strength of any competitor. Optimum tape rigidity and flexibility maximize feed efficiency rates to reduce the work and effort required to fish long runs with multiple bends. Specially designed contoured pulling eyes will not hang-up, even on .5" 90° bends. Eyelets accommodate six No. 10 bare wires. Choose from 50' and 100' lengths.

Stock No.	Part No.	Tape Length and Size	Reel Diameter	Prices	
				1-9	10-up
370X080	31-161	50' x .19"	12"	\$ 97.00	\$ 92.00
370X082	31-163	100' x .19"	12"	140.00	132.00

E. Rapid-Pak/S-Class™ Fish Tapes with Reels and Winders

Rapid-Pak models are loaded with time- and money-saving features which elevate fish tape handling to a whole new level. Revolutionary design with rotating center hub and reversible hinged winding knob for left- or right-hand use cuts wind-up time to one-third that of other fish tapes. It locks open to rewind tape into case smoothly and locks closed for easy storage. Rapid-Pak is so fast, it pays for itself in time savings after just a few pulls. Features S-Class tape with leader. Funnelled tape opening and stationary, non-rotating handle reduce critical stress on tape during pulling to help prevent tape breakage and kinking. Features sturdy, impact-resistant ABS case and handle. Choose from 50' and 100' sizes.

Stock No.	Part No.	Tape Length	Prices	
			1-9	10-up
370X091	31-187	50'	\$119.00	\$112.00
370X090	31-186	100'	160.00	151.00





Model 7153

3/8" Standard Electric Drill

Our standard 3/8" variable speed drill features Black & Decker's new M47 technology motor that produces more power and a higher torque. The drill has been completely redesigned to be more compact, better balanced and easier to handle. With new innovations such as straight, parallel sides for accurate drilling, center positioned handle for improved balance and redesigned back to allow greater hand pressure, this drill is in a class by itself. Other features include three-position switch (forward/reverse/off). Specifications include 1/4-hp motor, 2.2 amps and 0-1200 rpm. The 7153 weighs 2.5 pounds.

394X120 Model 7153 Drill1-5, \$52.25 ea.; 6-up, \$48.00 ea.



Model 7254

1/2" Standard Electric Drill

This standard 1/2" variable speed drill lets you pick the speed to suit the application. Features include reversing switch, recessed center locking button, triple gear reduction and shunted brush system. This double insulated drill has a capacity of up to 1/2" in steel or 1" in hardwood. A general-purpose electric drill, Model 7254 was designed for the occasional big job. Motor specifications include: 3/8 hp, 3 amps, 120 volts ac, 0-550 rpm.

Model 7254 Drill

394X1701-5, \$79.00 ea.; 6-up, \$72.50 ea.



Model 2755K-2

Cyclone 3/8" Cordless Adjustable Clutch Driver/Drill Kit

Black & Decker's new 9.6-volt Cyclone is a heavy-duty cordless driver/drill combination. Model 2755K-2 features a fan-cooled, high-output motor that's powerful and provides long life. Its mid-handle design furnishes greater balance for more comfortable use. A planetary gear transmission supplies efficient power transfer through a five-planet gear design for smooth operation and long life.

The keyless chuck reduces bit change over time. Two variable-speed ranges assure versatility. Ball and roller bearings deliver smooth operation and long life. Cyclone's high-impact polycarbonate housing resists breakage and cracking. The battery pack utilizes "no memory" cells and can be recharged over 1200 times.



Specifications include 9.6 volts, 0-400/1200 no-load rpm and 156 inch-pounds maximum torque. Includes a one-hour charger, two 9.6-volt batteries and plastic case. The 9.25" tool weighs 3.7 pounds. A 9.6-volt Replacement Energy Pack is optional.

Model 2755K-2 Driver/Drill Kit

394X067 ..1-5, \$265.00 ea.; 6-up, \$239.00 ea.

97048 Replacement Energy Pack

394X600\$40.00 ea.



Model 5070

3/8" VSR Hammerdrill

Model 5070 is a lightweight and compact tool that's not short on powerful features. It has a hefty 5-amp drill motor and a no-load speed of 0-2500 rpm (0-50,000 BPM). The Black & Decker 5070 features variable speed and reversing capabilities for maximum operator control and accurate hole placement. It also has a positive-locking collar and ball/sleeve bearings.

The 5070 belongs in every installer's vehicle. Its drilling capacity is up to 1/2" in masonry, 3/8" in tile or hard brick, 3/8" in steel and 3/4" in hardwood. At only 11.5" long and weighing just 4.5 pounds, Model 5070 is an ideal tool for overhead jobs. It comes complete with side handle, chuck key, chuck key holder and depth rod.

Model 5070 Drill

394X0821-5, \$225.00 ea.; 6-up, \$207.00 ea.

Model DW130

1/2" Heavy-Duty Electric Drill

The DeWalt DW130 is a heavy-duty spade handle drill with reversing capability. It features 100% ball and roller bearings and die cast metal gear housing. This high-performance industrial tool has a machined steel chuck and ac/dc rocker switch. A versatile model, it offers a multi-position rear spade handle and a three-position side handle.



Model

DW130 has a drilling capacity from .5" up to 4" in steel applications and from 1.5" up to 5" in wood applications. Specifications include 7 amps and 450 rpm. It includes a chuck key and holder. The DW130 drill weighs 7.5 pounds.

395X030 Model DW130 Drill1-5, \$260.00 ea.; 6-up, \$234.00 ea.





VP730 Cordless PowerDriver

High-Torque Turning Power for Heavy-Duty Tasks

Black & Decker's Cordless PowerDriver is just what you've been wanting — a more powerful screwdriver. With 40-inch pounds torque and 180 rpm, it's the ideal power tool for heavy-duty applications through such tough surfaces as oak, brick and sheet metal. A three-cell motor supplies extra turning power. The handle provides improved grip for smoother driving. An automatic spindle lock is provided for manual use and continuous charge for extra long run time. It screws 140 #10 x 1" into pine on a single charge. Use the drill bit, two screwdriver bits and two nut runners for pilot hole drilling, nutrunning and access to extra tight corners. The 11-inch tool weighs 1 pound. Includes wall-mount charging base. Two-year warranty.

394X360 Model VP730 PowerDriver.....1-5, \$57.50 ea.; 6-up, \$52.00 ea.

DW991K Heavy-Duty Cordless Driver/Drill Kit

DeWalt's Most Powerful Cordless Drill

Model DW991K is a 3/8-inch heavy-duty cordless driver/drill kit with adjustable clutch. This dual-range model features VSR 0-450 rpms in low and 0-1400 rpms in high. It has a high-performance, fan-cooled motor and replaceable brushes. An industrial-duty driver/drill. Model DW991K features anti-slip comfort grip, heavy-duty keyless chuck and electric brake. This powerful 14.4-volt model provides 275-watt maximum power output and weighs 5 pounds. Standard equipment includes double-ended screwdriver bit, XR PACK™ extended run-time batteries and one-hour charger and in a steel case. One-year warranty.

395X385 DW991K Drill Kit.....1-5, \$363.00 ea.; 6-up, \$327.00 ea.

395X901 DW9091 14.4-Volt Battery Pack.....79.00 ea.

DW972K-2 Heavy-Duty Cordless Drill/Driver Kit

High-Performance Tool with Two Batteries

DeWalt's DW972K-2 3/8-inch, variable-speed, cordless drill/driver has a high-performance, fan-cooled motor. It features adjustable clutch torque control and dual-range gearing. This 12-V industrial-duty, reversible model changes from drill to dual-range screwdriver with preset torque at the flip of a switch. Features VSR 1-450/0-1400 rpms and 220-W maximum power output. A heavy-duty keyless chuck changes bits quickly without having to keep track of a chuck key. Other features include electric brake, replaceable brushes and anti-slip comfort grip. This 4.6-pound tool includes double-ended screwdriver bit, two 12-V XR PACK™ extended run-time batteries and one-hour charger in a heavy-gauge steel carrying case. One-year warranty.

395X380 DW972K-2 Drill Kit.....1-5, \$338.00 ea.; 6-up, \$305.00 ea.

395X870 DW9050 Heavy-Duty 12-Volt Battery Pack.....65.00 ea.

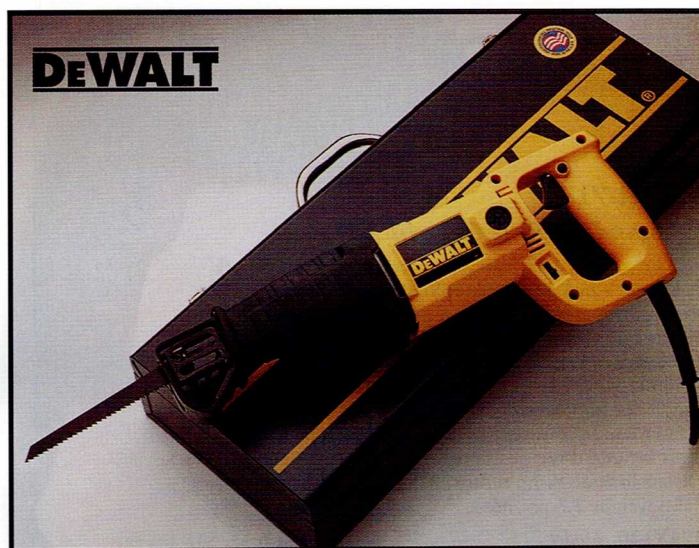
395X820 DW9031 Cordless Power Tool Holster.....28.00 ea.

DW9115 Battery Supercharger™

The World's Most Advanced Ni-Cad Battery Charger

Charge DeWalt battery packs in 15 minutes or less! The DW9115 Supercharger™ lengthens battery life up to three times. LEDs indicate battery status. Trickle charge ensures 100% charge when battery is needed.

395X900 DW9115 Supercharger.....1-5, \$152.00 ea.; 6-up, \$137.00 ea.

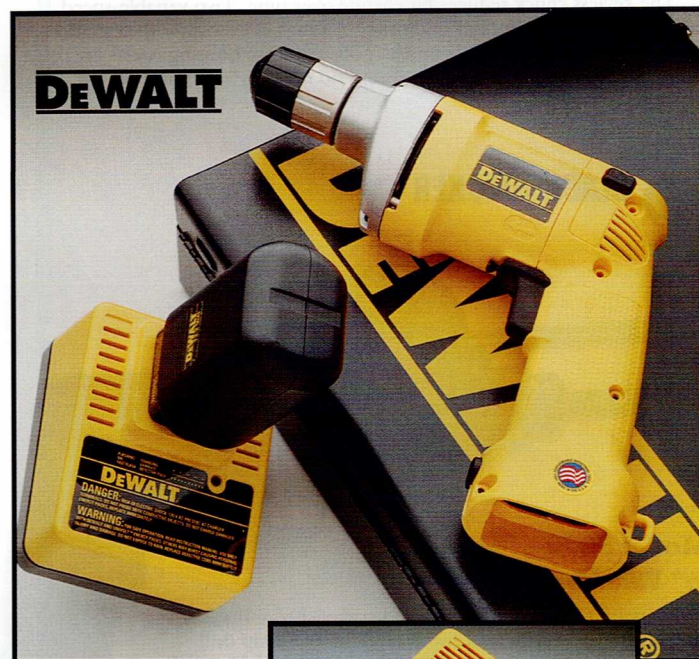


DW304K Heavy-Duty Reciprocating Saw Kit

High-Performance Variable-Speed Tool

DeWalt's Model DW304K is a heavy-duty, 6.0-amp, variable-speed reciprocating saw. It features a dual range of 0-1800 strokes per minute low and 0-2400 spm high. This high-performance, industrial-quality saw supplies a 620-watt maximum power output. It provides a 1 1/8-inch stroke length that will handle the toughest tasks quickly and efficiently. Model DW304K features ball and roller bearing construction designed to provide long life. Brushes are externally accessible. The 6.9-pound DW304K measures 16.7 inches in length without blade. It comes complete with a blade assortment, wrench holder, Allen wrench, hex key and heavy-gauge steel carrying case. Model DW304K is backed by a one-year warranty.

395X300 DW304K Saw Kit.....1-5, \$209.00 ea.; 6-up, \$188.00 ea.



Makita Professional Series Cordless Power Tools

Makita quality is durable, dependable and portable. Use these 9.6- and 12-volt battery-powered tools anywhere. This series features remarkable removable, rechargeable battery systems. The high-quality ni-cad batteries short, compact and easy to handle. Their distinctive bright orange color is easy to spot. Battery chargers are optional.

The powerful Makpak Professional Series combines advanced technology and convenience. Cordless models set you free from extension cords and the hassles of working in hard-to-reach places. More power and longer duty cycles are at your command. High-impact, corrosion-resistant housings provide long life. This is a combination that can't be beat.



6201DWHE 3/8-Inch Cordless Driver/Drill Kit

**Keyless Chuck Holds Strong
with 174 Fastening Torque**

This 9.6-volt cordless reversible driver/drill nearly doubles the power of the competition. Its motor increases efficiency and eliminates the need for overload protection. A positive-locking keyless chuck holds the bit securely. Offers six torque settings in two gear ranges. Drills 3/8-inch steel, 3/16-inch wood and #14 x 2 3/16-inch wood screws. Features two-speed gear selection, electric brake to seat screws, feedback circuit and slim balanced handle. Includes #2 Phillips bit, two 9.6-V batteries with cover, one-hour dc charger, belt clip and plastic tool case. The 9.4-inch tool weighs 3.7 pounds. One-year warranty.

6201DWHE Kit

355X100.....1-5, \$272.00 ea.
6-up, 245.00 ea.

355X400 192404-1 9.6-V DC Replacement Battery.....74.00 ea.

6202DWG Cordless Driver-Drill Kit New Generation 9.6-Volt Battery Technology

Model 6202DWG 3/8" (10-mm) Cordless Driver-Drill Kit features a 9.6-volt high-capacity battery with a unique power display panel. This two-speed model provides variable speed and reverse. It drills 3/16-inch wood, 3/8-inch steel and #14 x 2 3/16-inch woodscrews.

The removable 9.6-volt high-capacity power display battery offers 40% more capacity per charge! Power display functions include battery check which indicates remaining battery energy, battery deterioration check for remaining service life and tool overload indication.

Other features include electronic speed control for constant speed and high power regardless of load variation. Two-speed gear selection (0-350 rpm or 0-1100 rpm) provides easy start-ups. You will appreciate the keyless chuck system for easy, quick bit changes. A positive lock feature (patent pending) helps eliminate loosening or over-tightening of bit. An electric brake gives incredibly accurate control for pinpoint seating of the screw head. A six-stage torque setting in both high and low speeds allows for a variety of fastening applications. Attach the handy belt clip to either side of the tool. Use the tri-voltage charger to charge 7.2-, 9.6- and 12-volt Makita batteries in 45 minutes or high-capacity batteries in one hour.

Kit includes 9.6-V high-capacity power display battery, high-capacity charger, keyless chuck, #2 Phillips bit, battery cover, belt clip and plastic tool case. The 9.4-inch tool weighs 3.7 pounds with battery. One-year warranty.

355X200 6202DWG Driver Kit.....1-5, \$332.00 ea.; 6-up, \$299.00 ea.

355X400 192404-1 9.6-V DC Replacements Battery.....74.00 ea.



6212DWG Cordless Driver-Drill Kit New Generation 12-Volt Battery Technology

Model 6212DWG 3/8" (10-mm) Cordless Driver-Drill Kit features a 12-volt high-capacity battery with a unique power display panel. This super powerful model provides maximum drilling capacities of 3/16-inch wood and 3/8-inch steel. Makita's removable 12-volt high-capacity power display battery offers 40% more capacity per charge! Power display functions include battery check which indicates remaining battery energy, battery deterioration check for remaining battery service life and tool overload indication.

Other features include electronic speed control for constant speed regardless of load variation. No load speed is 0-370 and 0-1150 rpm. You get two-speed gear selection with variable speed and reverse. The keyless chuck with positive lock reduces loosening and overtightening of the bit. An electric brake gives incredibly accurate control for pinpoint seating of the screw head. Six torque settings in each of two gear ranges offer a total of 12 settings. Attach the handy belt clip to either side of this cordless tool. Use the tri-voltage charger to charge 7.2-, 9.6- and 12-volt Makita batteries in just 45 minutes or high-capacity batteries in one hour.

Kit includes 12-V high-capacity power display battery, high-capacity charger, keyless chuck, Phillips bit, battery cover, belt clip and plastic tool case. The 9.4-inch tool weighs 4 pounds with battery. One-year warranty.

355X255 6212DWG Kit.....1-5, \$345.00 ea.; 6-up, \$310.00 ea.

355X410 192407-5 12-V DC Replacement Battery.....84.00 ea.





Model EY503B

Cordless Drill and Driver Kit

- Two-speed gear box and 1/4" hex drive
- Multi-stage clutch plus drill
- Maximum torque at low speed is 26 inch pounds
- Choose one-hour or 15-minute charge system

Panasonic's 2.4-volt cordless rechargeable drill and driver easily converts from straight to pistol form. Use it for appliance repair, circuit board assembly and production line assembly work. It features two-speed gear box and 1/4" hex drive. This multi-stage clutch plus drill is reversible and manual tightening. Maximum torque at low speed is 26 inch pounds. Speed at no load is 400/200 rpm. Maximum clutch torque is approximately 3.5-17.5 inch pounds at six position.

Choose from two power tool versions. The EY503B is the standard model with a one-hour charge system. Model EY6220B comes with a 15-minute charge system. The unit is 9.1" x 1.5" and weighs .9-pounds including battery. One-year warranty. A 2.4-volt 15-minute battery pack is optional. Ninety-day warranty.

Panasonic

EY503B Cordless Drill and Driver Kit

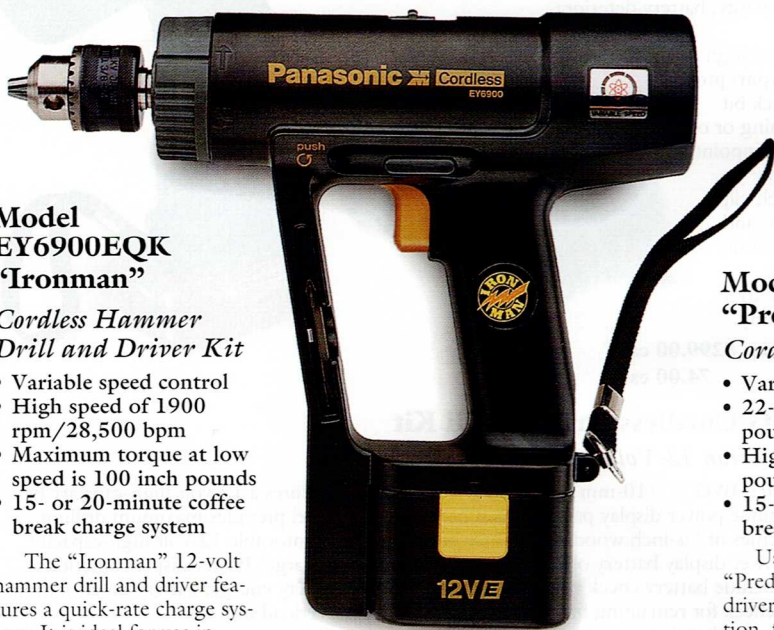
357X100 1-5, \$112.00 ea.; 6-up, \$99.50 ea.

EY6220B Quick Charge Drill and Driver Kit

357X622 1-5, \$149.00 ea.; 6-up, \$134.00 ea.

EY9021B Optional Battery Pack (for use with both units)

357X800 \$27.00 ea.



Model EY6900EQK "Ironman"

Cordless Hammer Drill and Driver Kit

- Variable speed control
- High speed of 1900 rpm/28,500 bpm
- Maximum torque at low speed is 100 inch pounds
- 15- or 20-minute coffee break charge system

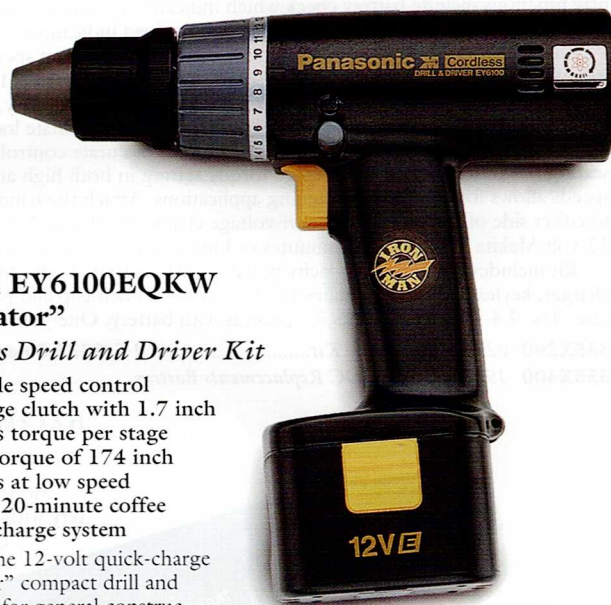
The "Ironman" 12-volt hammer drill and driver features a quick-rate charge system. It is ideal for use in general construction, concrete drilling and plumbing applications. This high-speed power tool features blow force of 370 pounds and high torque of 100 inch pounds at low speed. Reversible Ironman provides maximum torque at all speeds, variable speed control, electric brake, two-speed gear box and 3/8" heavy-duty drill chuck. Blow rate per minute is 3700-28,500/1000-8000 bpm. Speed at no load is 250-1900/70-530 rpm.

Includes safety wrist strap. Battery charging time is 20 minutes. The "Ironman" is 10.7" x 9.8" x 2.7" and weighs 4.6 pounds including battery. One-year warranty. For 40% more work per charge, order the 12-volt "Ironman" high-capacity battery pack separately. This optional coffee break battery charges in just 15-minutes. Ninety-day warranty.

EY6900EQK Hammer Drill and Driver Kit

357X690 1-5, \$335.00 ea.; 6-up, \$299.00 ea.

357X910 EY9101B 12-Volt "Ironman" Repl. Battery Pack 74.00 ea.



Model EY6100EQKW "Predator"

Cordless Drill and Driver Kit

- Variable speed control
- 22-stage clutch with 1.7 inch pounds torque per stage
- High torque of 174 inch pounds at low speed
- 15- or 20-minute coffee break charge system

Use the 12-volt quick-charge "Predator" compact drill and driver kit for general construction, finishing carpentry, electric installation work and plumbing applications. It features high torque of 174 inch pounds, maximum torque at all speeds and variable speed control. This reversible tool has 22-stage clutch, 3/8" heavy-duty keyless chuck, electric brake and two-speed gear box. It uses manual tightening. Maximum torque at low speed is 174 inch pounds. Speed at no load is 180-1300/50-350 rpm. Clutch torque is approximately 4.3-39 inch pounds (1.7 inch pounds per stage for 21 stages).

Includes two batteries. Battery charging time is 20 minutes. The "Predator" is 8.7" x 8.5" x 2.3" and weighs 3.8 pounds including batteries. One-year warranty. For 40% more work per charge, order the 12-volt "Ironman" high-capacity battery pack separately. This optional coffee break battery charges in just 15 minutes. Ninety-day warranty.

EY6100EQKW Drill and Driver Kit

357X610 1-5, \$317.00 ea.; 6-up, \$285.00 ea.

357X910 EY9101B 12-Volt "Ironman" Repl. Battery Pack 74.00 ea.



Model EY6780EQK Corner Master Cordless Off-Set Drill and Driver Kit

Panasonic
CORDLESS POWER TOOLS

- Reversible drill with 22-stage clutch and quick-connect chuck
- 15-minute "Coffee Break" charge system
- Variable speed control with maximum torque at all speeds

Panasonic's Corner Master is a 9.6-volt Predator Series power drill with a 15-minute charge system. It lives up to its name by mastering tight corners. This compact, lightweight cordless drill provides the closest off-set distance of any cordless drill/driver. An eight-position revolving mechanism provides an off-set distance of just $\frac{5}{16}$ ". Typical applications include cabinet installation plus driving and light-weight drilling into wood in tight spots such as curtain rail installation close to the ceiling.

Features include variable speed control with maximum torque at all speeds and one-speed gear box. This reversible drill features a precision 22-stage clutch, electric brake and $\frac{1}{4}$ " hex quick-connect chuck. The Corner Master uses the Iron Man High-Capacity Battery Pack and 15-Minute "Coffee Break" Charge System. Maximum torque at low speed is 52 inch pounds. Speed at no load is 120-800 rpm. Clutch torque is approximately 4.3-39 inch pounds (1.7 inch pounds per stage for a total of 21 stages). Maximum torque at drilling position in Stage 22.

Model EY6780EQK kit includes power tool, battery pack, battery charger and operating instructions packaged in a sturdy carrying case. The Corner Master measures 8.4" x 8.1" x 2.2" and weighs just 1 pound including the battery. The storage case measures 16.5" x 13.5" x 4" and weighs 3 pounds with kit contents. One-year warranty (battery pack 90 days).

357X678 EY6780EQK Corner Master Drill and Driver Kit.....1-5, \$295.00 ea.; 6-up, \$266.00 ea.



Model KD-280AK-46 Cordless Screwdriver Kit

- Six-stage adjustable torque
- Removable battery with three-hour charge time
- 170 rpm, torque to 21 inch pounds

The 3.6-volt KD-280A Screwdriver with removable battery is a cordless power tool packaged with assorted useful accessories in a convenient kit. Its foldable grip handle is designed for convenience and control. The durable center pivot allows the handle to be used in a conventional unfolded shape or folded for use as a pistol grip tool. Simply push the start/stop switch to start the tool and release it to stop.

This tool features forward/reverse switch and six-stage adjustable torque control. When properly adjusted, the clutch will slip at a preset torque to prevent driving the screw too deep or to prevent damage to the screw and the tool. For driving applications, start at the lowest clutch setting and increase it until the desired results are obtained. The detachable battery pack has a three- to five-hour charging time. Specifications include 170 rpm and torque to 21 inch pounds. No-load speed is 180 rpm.

Kit contents include BP-36B 3.6-Volt Battery Pack, AD-36 3.6-Volt Charge Adaptor, 14 sockets (sizes 6-12 mm, $\frac{3}{16}$ "- $\frac{1}{2}$ "), 26 driver bits (three flat: $\frac{3}{16}$ ", $\frac{1}{4}$ ", $\frac{9}{32}$ "; three Robertson: S1, S2, S3; three Phillips: #1, #2, #3; 12 Hex: 2-6 mm, $\frac{9}{32}$ "- $\frac{1}{4}$ "; five Torks: T10, T15, T20, T25, T30), bit holder, socket adaptor and instruction manual. All these supplies are neatly organized in a handy blowing case for convenient portability. The 2.25-pound tool is 10.5" long unfolded. The case measures 11.25" x 7.75" x 2.6" and weighs 5.5 pounds with contents. One-year warranty.

352X280 KD-280AK-46 Cordless Screwdriver Kit.....1-11, \$66.00 ea.; 12-up, \$59.50 ea.

KUMAS

Model KD-303K-57 Cordless Drill/Driver Kit

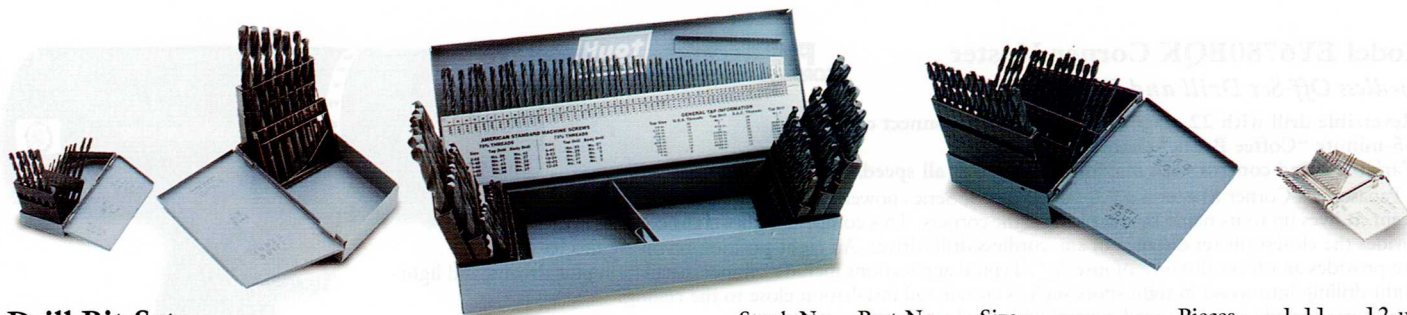
- Six-stage adjustable torque
- Built-in battery with three-hour charge time
- Keyed chuck, 500 rpm, torque to 52 inch pounds

Model KD-303 is a Kumas 4.8-Volt $\frac{3}{8}$ " Drill/Driver. This cordless rechargeable tool is packaged with an extensive array of accessories in a convenient 57-piece kit. The KD-303 reversible power tool features keyed chuck and six-stage adjustable torque control. When properly adjusted, the clutch will slip at a preset torque setting to prevent driving or drilling too deeply. This also prevents causing any damage to the tool. Use the cordless tool for drilling a variety of materials including wood, metal and masonry. This tool's built-in battery has a fast three-hour charge time. Specifications include 500 rpm and torque to 52 inch pounds.

The KD-303K-57 kit contents include 4.8-Volt AD-48 Charger Adaptor, 13 drill bits for wood (sizes $\frac{1}{16}$ "- $\frac{1}{4}$ "), 14 socket bit sizes (6-12 mm, $\frac{3}{16}$ "- $\frac{1}{2}$ "), 24 screwdriver bits (25 mm L: five flat, four Phillips, three Robertson, six Hex and six Torks), chuck key, bit holder, socket adapter and instruction manual. All these supplies are neatly organized in a handy blowing case for convenient portability. The 3.6-pound power tool measures 8.75" x 6.5" x 2.1". The carrying case measures 14" x 10.25" x 3" and weighs 8.25 pounds with contents. One-year warranty.

352X303 KD-303K-57 Cordless Drill/Driver Kit.....1-11, \$76.00 ea.; 12-up, \$68.50 ea.





Drill Bit Sets

Use these professional-quality, high-speed steel drill bits for drilling metal, wood and plastic. They are designed especially for use in electric drills. Each jobbers length drill bit is manufactured to the most rigorous specifications. Imported bits are packaged in U.S.-made Huot metal indexes. Choose from assorted fractional, number and letter sizes in metal cases.



Tap and Drill Set

Includes the Six Most Popular Sizes

A. For electricians' tapping and drilling needs. This 13-piece set includes six chromed taps and six matching high-speed steel drills plus one T-handle wrench. Tap sizes are 4-40, 6-32, 8-32, 10-24, 10-32 and ¼-20. Drill sizes include Nos. 43, 36, 29, 25, 21 and 7. Taps, drills and wrench fit into handy, tough molded plastic case.

100X835 21698 Tap and Drill Set1-11, \$18.00 ea.; 12-up, \$15.25 ea.

Seven-Piece Screwdriver Bit Set

Works with Any Variable-Speed Drill

B. Most popular size bits are combined with magnetic bit holder for all-purpose power driving. Great for installing storm doors, windows, etc. Ideal companion for any variable-speed drill. Set contains insert bit Nos. 1 and 2 Phillips; Nos. 6-8, 8-10, 10-12 slotted; ½" square drive socket adapter; and magnetic bit holder. Display packaged. Standard shipping pack: 1.

100X800 15591 Screwdriver Bit Set.....1-11, \$11.25 ea.; 12-up, \$9.50 ea



Unibit Step Drills

Unique single-flute design quickly drills perfectly round holes in thin materials with less effort than other bits. Cutting steps of progressively larger diameters drill up to 13 hole sizes with a single bit, not an entire costly set. Cutting edge enters one step at a time to cut rapidly in small bites without over-taxing motor. Designed for use with thin metals, Unibits also drill through wood, composition board plus plexiglass and plastics that often crack with conventional bits.

Kit 502 drills up to 28 hole sizes with just three bits (sizes #1-#3). All-around Unibit #1 is for most common drilling jobs. Drill 13 hole sizes (⅛"-½" diameter in ⅛" increments) with ¼" shank, ⅛" step thickness. The #2 drills standard hole sizes in materials up to ⅜" thick. With ¼" shank, ⅜" thickness, drill six sizes (⅜"-½" in ⅛" increments). Use #3 for medium-sized holes. Drill nine sizes (¼"-¾" in ⅛" increments) with ⅜" shank, ⅜" thickness. Combine popular sizes with #4, the fastest step drill to a ½" knockout. With ⅜" shank, ⅜" thickness, drill 12 sizes (⅜"-7/8" in ⅛" increments).

321X502 502 Unibit Set (10502).....1-9, \$60.00 ea.; 10-up, \$56.00 ea.
321X001 #1 Unibit (10101).....1-9, 17.00 ea.; 10-up, 15.50 ea.
321X002 #2 Unibit (10102).....1-9, 17.00 ea.; 10-up, 15.50 ea.
321X003 #3 Unibit (10103).....1-9, 29.00 ea.; 10-up, 26.00 ea.
321X004 #4 Unibit (10104).....1-9, 36.00 ea.; 10-up, 32.50 ea.

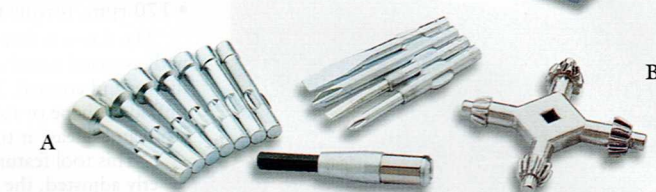
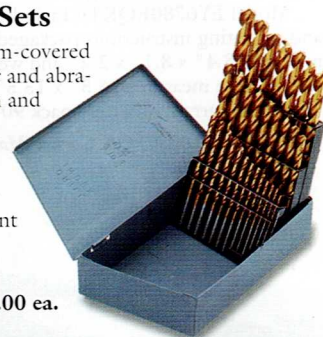
Stock No.	Part No.	Size	Pieces	1-11	12-up
613X493	J13	⅛" to ¼"	13	\$ 10.00	\$ 9.00
613X515	J15	⅛" to ½"	15	30.00	25.50
613X615	J115	A-Z, #1-60, ⅛" to ½"	115	125.00	105.00
613X560	J60	#1-60 wire gauge	60	41.00	34.00
613X565	J20	#61-80 wire gauge	20	15.00	12.50

Titanium-Coated Drill Bit Sets

Longest lasting bits available! Titanium-covered drill bits have increased resistance to wear and abrasion. They provide 75% faster penetration and last up to six times longer than standard steel bits. Organized in rugged steel box with hinged indexes. Bit sizes clearly visible. Includes 29 bits from ⅛" to ½" by 64ths. Sizes ⅛" and up are 135° split point to start cutting immediately.

12345 29-Piece Set

100X762..1-5, \$185.00 ea.; 6-up, \$157.00 ea.



Xcelite Bit Set

Includes the 12 Most Popular Sizes

A. This Series 99® Tool Set is designed for use with cordless rechargeable screwdrivers. It contains 12 of the most popular nutdriver and screwdriver sizes. You get seven stubby nutdrivers (⅜" x 7/32", ¼", ⅜", ⅝", 1 1/32" and ⅜"), two stubby slotted screwdrivers (⅜" and ¼") and two stubby Phillips screwdrivers (#1 and #2). It also includes a 99-PA Cordless Screwdriver Adapter. The 99-PA-50 set is packaged in a convenient vinyl carrying pouch.

108X12699-PA-50 Tool Set

1-11, \$18.50 ea.

12-up, 17.00 ea.

Master Chuck II

Opens 127 Different Chucks

B. Small, high-quality Master Chuck II opens 127 different chucks. It is designed for use with ¼", ⅜" and light-duty ½" cordless drills. History shows that chuck keys are lost more often from cordless than ac-powered drills. Save wear on chucks by always having the proper key size. Made of polished stainless steel, innovative and popular Master Chuck II will not rust.

127X300 ...ST-13A Master Chuck II

1-11, \$15.00 ea.

12-up, 13.50 ea.

40-Piece Deluxe Tap and Die Set

Complete set of taps and hexagon dies comes in a molded plastic case. It includes 17 cuts (17 taps and 17 1-inch dies) plus one die stock, one tap wrench and two sizes of T-handle wrenches. Kit also includes a screw pitch gauge and an adjusting screwdriver.

21729 Tap and Die Set

100X842...1-5, \$104.00 ea.; 6-up, \$88.00 ea.



Thread Type	Size and Threads per Inch					
NC	4-40	6-32	8-32	10-24	12-24	¼-20
NC	⅝-18	⅜-16	7/16-14	½-13		
NF	10-32	¼-28	⅝-24	⅜-24	7/16-20	½-20
NPTs	⅜-27					





AMP

Deluxe Modular Plug Kit

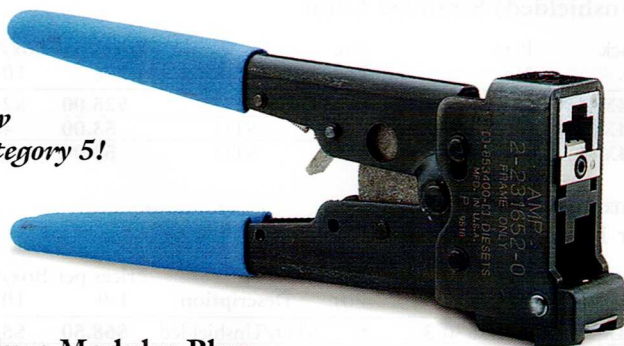
Includes Four-, Six- and Eight-Position Plugs

A perfect shop or field kit for anyone who makes occasional repairs or installations of RJ-type modular plugs. You get an AMP® Deluxe Modular Plug Termination Tool described at the right. A cable cutter, cable jacket stripper and smooth ratchet for full connector termination, it has cushion grip, spring-actuated handles for maximum operator comfort. Use this tool with AMP four-, six- and eight-position line cord connectors (plugs) by interchanging the die set. (Eight-position RJ-45 plugs require separate dies.)

The 1-231652 Termination Tool comes with four- to six-position die set (RJ11), eight-position (RJ-45) die set and 25 each four-, six- and eight-position plugs. All genuine AMP products come in a compact, sturdy metal box. The 4-pound Kit 100 measures 8" x 11.5" x 1.5". One-year warranty.

194X001 Kit 100.....1-5, \$215.00 ea.; 6-up, \$199.00 ea.

**New
Category 5!**

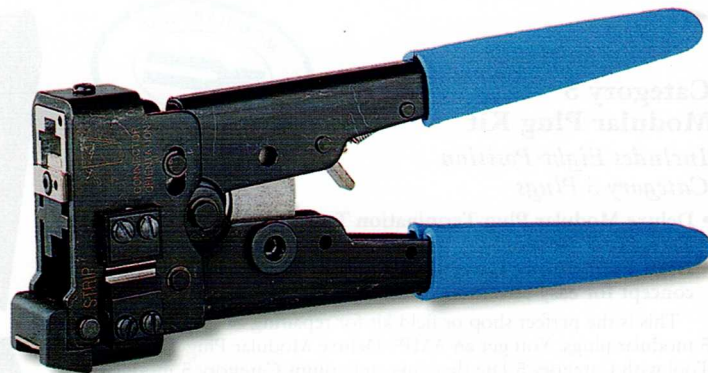


Deluxe Modular Plug Termination Tool

Category 5 Die Terminates RJ45 Plugs

- Full-cycle tool cuts, strips and crimps
- Exceeds standards for Category 5 requirements
- Durable, all-metal construction for top performance

This professional handtool cuts and crimps modular plug connectors. It features the same deluxe frame as the tool above, but its white color-coded die terminates eight-position Category 5 modular connectors. The special



Deluxe Modular Plug Termination Tools

Terminate RJ11, RJ45 and MMJ Plugs

- Full-cycle tools cut, strip and crimp
- Utilize replaceable/interchangeable die sets
- Perform line cord and handset crimps
- Durable, all-metal construction for top performance

Professional handtools cut and crimp modular plug connectors. Choose from four interchangeable, replaceable (color-coded) die sets to terminate four- through eight-position modular connectors (for both linecord and handset plug sizes) and DEC-type (offset) plugs.

Durable tools feature cable cutter, cable jacket stripper, smooth ratchet to assure full connector termination and cushion grip plus spring-actuated handles for maximum operator comfort. Ratchet release allows disengagement of ratchet for faulty termination.

Each tool includes applicable die set for connector size(s) or application selected. Interchangeable die sets convert tool to accept any other connector size or type (RJ11, RJ45 and MMJ). Each all-metal 7" tool is 14 ounces.

Complete Tool (Four- to Six-Position Line Cord RJ11)

194X105 2-231652-8.....1-5, \$129.00 ea.; 6-up, \$119.00 ea.

194X122 853400-8 Four- to Six-Position Die Set Only.....40.00 ea.

Complete Tool (Eight-Position Line Cord RJ45)

194X100 2-231652-1.....1-5, \$129.00 ea.; 6-up, \$119.00 ea.

194X120 853400-1 Eight-Position Die Set Only.....40.00 ea.

Complete Tool (Four-Position Handset Cord)

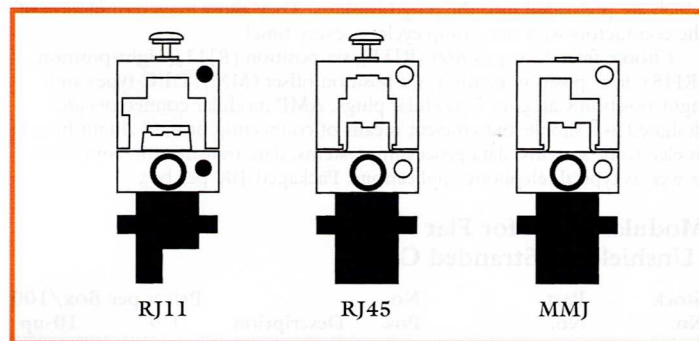
194X110 2-231652-3.....1-5, \$129.00 ea.; 6-up, \$119.00 ea.

194X124 853400-3 Handset Die Set Only.....40.00 ea.

Complete Tool (Six-Position Offset, DEC-Type MMJ)

194X114 2-231652-6.....1-5, \$129.00 ea.; 6-up, \$119.00 ea.

194X128 853400-6 MMJ Offset Die Set Only.....40.00 ea.



die exceeds EIA/TIA 568A and TSB-40A requirements for Category 5 Four-Pair (RJ45) UTP applications.

A durable, all-metal tool, it features cable cutter, cable jacket stripper, smooth ratchet to assure full connector termination and cushion grip plus spring-actuated handles for maximum operator comfort. Ratchet release allows disengagement of ratchet for faulty termination.

The complete tool includes a Category 5 Four-Pair (RJ45) UTP die set. Frame only and die set only also may be purchased separately. The all-metal 7" tool weighs 14 ounces.

Complete Tool (Eight-Position Category 5 Die)

194X115 3-231652-0.....1-5, \$129.00 ea.; 6-up, \$119.00 ea.

194X099 2-231652-0 Frame Only.....1-5, 89.00 ea.; 6-up, 82.00 ea.

194X118 1-853400-0 Category 5 Die Set Only.....40.00 ea.





AMP

Category 5 Modular Plug Kit

*Includes Eight-Position
Category 5 Plugs*

- Deluxe Modular Plug Termination Tool
- Category 5 die set
- High-Performance Category 5 Modular Plugs with load bar concept for easy termination

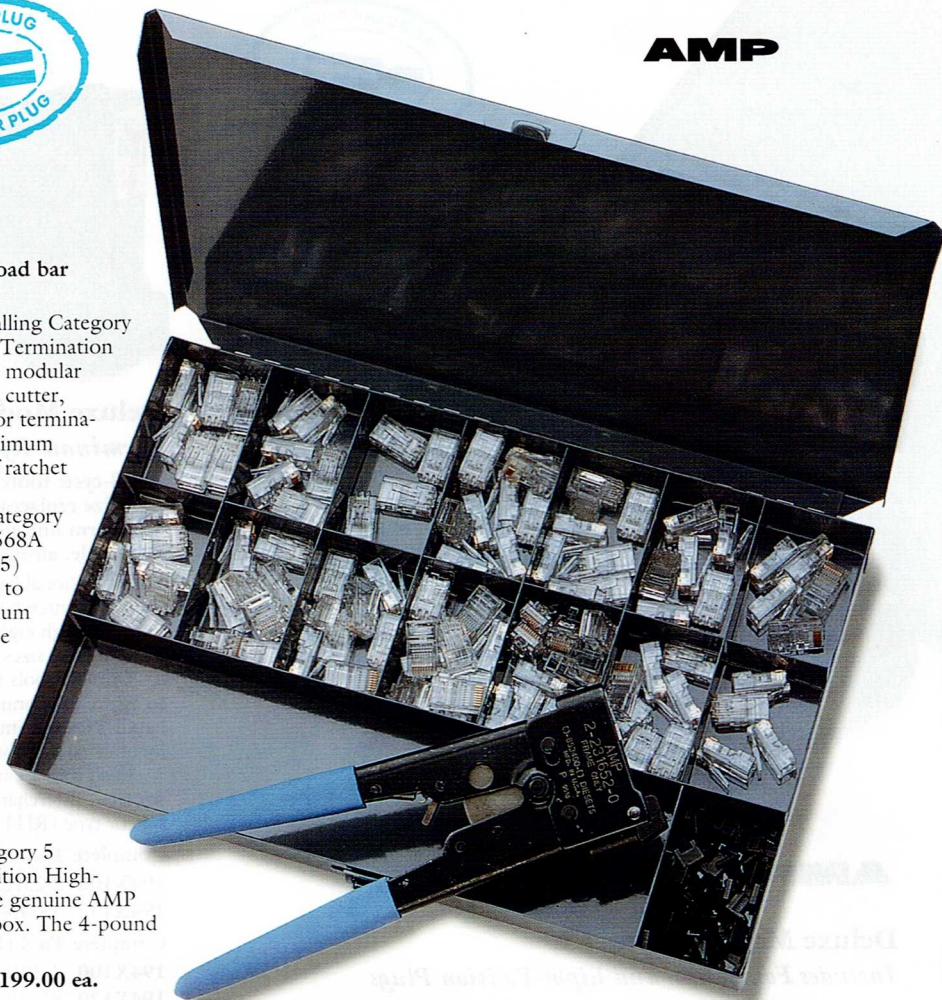
This is the perfect shop or field kit for repairing or installing Category 5 modular plugs. You get an AMP® Deluxe Modular Plug Termination Tool with Category 5 Die that cuts and crimps Category 5 modular plug connectors. This durable, all-metal tool features cable cutter, cable jacket stripper, smooth ratchet to assure full connector termination and cushion grip plus spring-actuated handles for maximum operator comfort. Ratchet release allows disengagement of ratchet for faulty termination.

The white color-coded die terminates eight-position Category 5 modular connectors. This special die exceeds EIA/TIA 568A and TSB-40A requirements for Category 5 Four-Pair (RJ45) UTP applications. Category 5 Modular Plugs are designed to accommodate 24 AWG stranded conductors with a maximum conductor insulation diameter of .039" (.99 mm) and cable jacket outside diameters in the range of .200-.215".

A load bar concept simplifies termination. Now you can easily load wires into a plug prior to termination while maintaining the 1/2" twist requirement. This eliminates the juggling of the past. A third hand is no longer required for cable assembly manufacturing. Conductors can be oriented into the load bar, trimmed and then simply slid into the connector housing.

The 3-231652-0 Termination Tool comes with a Category 5 Four-Pair (RJ45) UTP die set and 100 stranded eight-position High-Performance Category 5 Modular Plugs. All these parts are genuine AMP products and come organized in a compact, sturdy metal box. The 4-pound Kit 105 measures 8" x 11.5" x 1.5". One-year warranty.

194X007 Kit 1051-5, **\$215.00 ea.**; 6-up, **\$199.00 ea.**



Modular Plugs

Insist on the original. Insist on the best. Only genuine AMP® modular plugs are guaranteed to be reliable connection after connection. Originally developed for AT&T, these modular plugs are made to exacting specifications. They are constructed from clear thermoplastic housings with selectively gold-plated, high-strength copper alloy insulation piercing contacts which are preloaded into the plug housings. They allow mass termination of the conductors with one crimp cycle — every time!

Choose from four-position (RJ11), six-position (RJ11), eight-position (RJ45), four-position handset, six-position offset (MMJ, DEC-type) and eight-position Category 5 modular plugs. AMP modular connectors are designed as a simple and efficient means of connecting printed circuit boards in electronic systems, data processing systems, data transmission equipment as well as typical telephone applications. Packaged 100 per box.

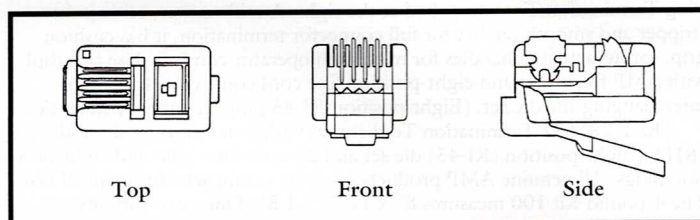
Modular Plugs for Flat (Unshielded) Stranded Cable

Stock No.	Part No.	No. Pos.	Description	Prices per Box/100	
				1-9	10-up
194X454	5-641335-3	4	STD	\$19.00	\$16.25
194X456	5-641337-3	6	STD	22.00	18.75
194X447	5-554739-3	8	STD	53.00	45.25
194X452	5-641334-3	4*	STD	19.00	16.25
194X448	5-555237-2	6-offset	STD	55.50	47.25
194X446	5-554743-3	8	Keyed	53.00	45.25

* Handset Type

Modular Plugs for Round (Unshielded) Solid Cable

Stock No.	Part No.	No. Pos.	Description	Prices per Box/100	
				1-9	10-up
194X449	5-555042-3	6	STD	\$23.50	\$20.00
194X444	5-554720-3	8	STD	56.50	48.25



Modular Plugs for Round (Unshielded) Stranded Cable

Stock No.	Part No.	No. Pos.	Description	Prices per Box/100	
				1-9	10-up
194X443	5-554710-3	6	STD	\$25.00	\$21.25
194X440	5-554169-3	8	STD	53.00	45.25
194X441	5-554170-3	8	STD	53.00	45.25

Category 5 Modular Plugs for Round, Stranded Cable

Stock No.	Part No.	No. Pos.	Description	Prices per Box/100	
				1-9	10-up
194X460	5-558530-3	8	STD/Unshielded	\$68.50	\$58.25
194X470	5-558595-3	8	Keyed/Unshielded	68.50	58.25
194X465	5-569552-3	8	STD/Shielded	150.00	127.50
194X468	5-558594-3	8	Keyed/Shielded	150.00	127.50

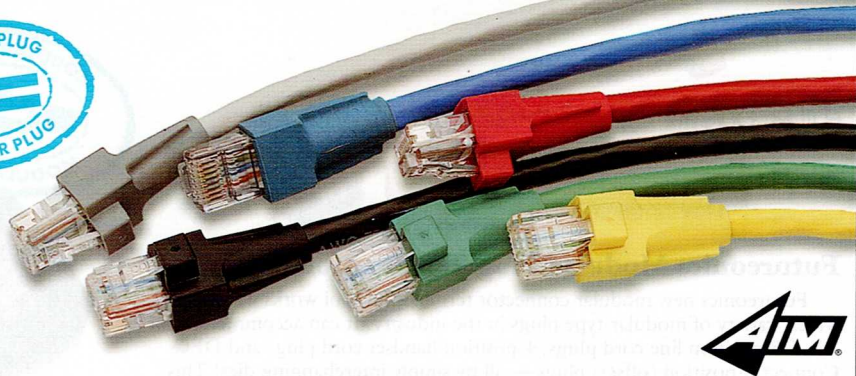
Category 5 Modular Plugs for Solid Cable

Stock No.	Part No.	No. Pos.	Description	Prices per Box/100	
				1-9	10-up
194X480	5-569278-3	8	STD/Unshielded	\$61.00	\$56.50



Category 5 Patch Cables

Category 5 Colored Patch Cables come with colored boots. Each cable is a different color and has four links. Round UTP 24-gauge stranded PVC cable is wired to 568B/WECCO/AT&T/258A configuration. Each cable has an RJ45 eight-position plug and is Category 5 configured 10BASE-T or 100BASE-T. Choose from gray cables with gray boots, blue cables with blue boots, red cables with red boots, black cables with black boots, green cables with gray boots and yellow cables with yellow boots. Select from the chart below. Lifetime warranty.



Gray Patch Cables with Gray Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X700	73-6680-7	Gray Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X705	73-6680-15	Gray Cat 5 Cable	15'	10.20	8.75
053X710	73-6680-25	Gray Cat 5 Cable	25'	14.20	12.25
053X715	73-6680-50	Gray Cat 5 Cable	50'	24.20	20.75

Blue Patch Cables with Blue Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X720	73-6692-7	Blue Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X723	73-6692-15	Blue Cat 5 Cable	15'	10.20	8.75
053X725	73-6692-25	Blue Cat 5 Cable	25'	14.20	12.25
053X727	73-6692-50	Blue Cat 5 Cable	50'	24.20	20.75

Red Patch Cables with Red Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X732	73-6694-7	Red Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X734	73-6694-15	Red Cat 5 Cable	15'	10.20	8.75
053X736	73-6694-25	Red Cat 5 Cable	25'	14.20	12.25
053X738	73-6694-50	Red Cat 5 Cable	50'	24.20	20.75

Black Patch Cables with Black Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X743	73-6691-7	Black Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X746	73-6691-15	Black Cat 5 Cable	15'	10.20	8.75
053X749	73-6691-25	Black Cat 5 Cable	25'	14.20	12.25
053X750	73-6691-50	Black Cat 5 Cable	50'	24.20	20.75

Green Patch Cables with Gray Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X754	73-6693-7	Green Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X758	73-6693-15	Green Cat 5 Cable	15'	10.20	8.75
053X762	73-6693-25	Green Cat 5 Cable	25'	14.20	12.25
053X766	73-6693-50	Green Cat 5 Cable	50'	24.20	20.75

Yellow Patch Cables with Yellow Boots

Stock No.	Part No.	Description	Length	Price Each	
				1-9	10-up
053X875	73-6695-7	Yellow Cat 5 Cable	7'	\$ 7.00	\$ 6.00
053X880	73-6695-15	Yellow Cat 5 Cable	15'	10.20	8.75
053X885	73-6695-25	Yellow Cat 5 Cable	25'	14.20	12.25
053X890	73-6695-50	Yellow Cat 5 Cable	50'	24.20	20.75

Weidmüller

Category 5 Termination Kits

These Category 5 kits are equipped to cut wire, crimp connectors plus test continuity and wiring configuration. Choose from two versions. The 1590 is for AMP plugs only. The 1588 has standard Category 5 RJ45 modular plugs.

Each installation kit contains a universal crimping tool for popular interconnect systems. Use this kit with coaxial connectors, fiberoptic connectors, open barrel contacts, solderless terminals, modular telephone plugs and wire ferrules. The crimper has a full ratcheting cycle, manual ratchet release, EZI-CHANGE™ die set screws and adjustable crimp tension. Each fully interchangeable die is hardened for long life. The Crimper has a five-year warranty.

An included Patch•Check is designed to test the continuity of telephone (RJ11) and computer data-link (RJ45) wiring. This hand-held instrument tests both RJ11 and RJ45 cord sets. It compares up to eight connections. Features include automatic test cycle and push-button operation. Patch•Check identifies open, shorted and cross connected wires with a clear LED display. Depress the push-button to review a sequential comparison of the wire position and continuity of the plugs at the end of the cable. This instrument features a durable high-impact case and is powered by a supplied 9-volt battery. The Patch•Check has a one-year warranty.

Each termination kit contains RJ45 Die Set and KT 8 Cutter. The 1590 also includes 50 Category 5 AMP plugs while the 1588 comes with 50 Category 5 standard plugs.

170X135	1590 Category 5 Termination Kit AMP	1-5, \$206.00 ea.; 6-up, \$186.00 ea.
170X130	1588 Category 5 Termination Kit	1-5, 185.00 ea.; 6-up, 167.00 ea.

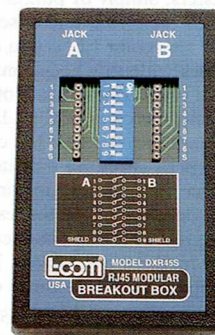


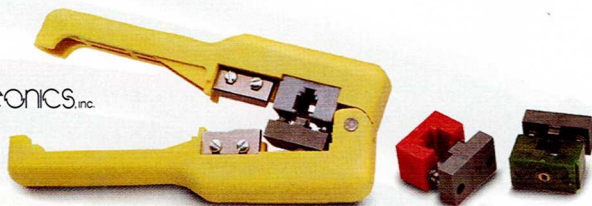
Shielded RJ45 Breakout Box

L-Com's DXR45S Breakout Box is intended for modifying the wiring in modular cords terminated by RJ45 plugs. This modular plug tester incorporates two high-grade shielded RJ45 keyed jacks, a nine-position dip switch and dual nine-position headers. Jumper wires are included in the rear compartment.

To modify wiring in a modular connection, first plug the DXR45S in series with the circuit. Do this by acquiring an extra RJ45 patch cord and plugging the breakout box in between. Once this is done, the user can close the lines between the RJ45 jacks by moving the dip switches to the right. Leaving the dip switches in the left position will leave those lines open. Shorts and wiring changes can be made by plugging the jumper wires into the sockets on the face of the unit. The shield of the RJ45 jack is connected to position nine of the dip switches. This can be used for shorting lines to the shield as needed. The DXR45S unit does not utilize a battery. Its intention is for modifying modular cable wiring only.

DXR45S Shielded RJ45 Jumper Box
668X100.....1-9, \$49.50 ea.; 10-up, \$44.50 ea.





Futureonics Modular Plug Termination Tool

Futureonics new modular connector termination tool works with the widest variety of modular-type plugs in the industry. It can accommodate all 2-4-6-8-position line cord plugs, 4-position handset cord plugs and DEC-Connect 6-position (offset) plugs — all by simply interchanging dies! This durable tool is preferred by the field installer because it is lightweight and extremely easy to use. A typical modular plug (AT&T-type including AMP) can be installed in under 15 seconds even by an inexperienced user.

It cuts, strips and crimps in just seconds — providing fast and reliable termination of modular cords. The tool frame is made of a very durable glass-filled nylon that provides much more comfort for the user, especially for medium to large volume work. Die sets are easily interchangeable and are even color-coded for quick identification. All components are sold individually and carry a limited factory lifetime warranty.

Tool Frame (with Cutter and Stripper) Only

215X100 MCT-2PC-HYCS.....1-11, \$74.00 ea.; 12-up, \$67.00 ea.

4-Position (Handset Cord) Die Set Only

215X200 MCT-D-4H.....\$67.00 ea.

2-4-6-Position (Line Cord) Die Set Only (for RJ11)

215X210 MCT-D-2346D.....\$71.50 ea.

8-Position (Line Cord) Die Set Only (for RJ45)

215X220 MCT-D-8D.....\$61.00 ea.

2-4-6-Position DEC-Connect Die Set Only (For MMJ)

215X230 MCT-D-MT4-6.....\$71.50 ea.

Replacement Cutter/Stripper Assembly

215X300 MCT-2PC-CS.....\$39.00 ea.



TELEDATA Crimpkit with 350 Connectors Modular Plug Kit

Complete kit includes everything necessary to tackle all telephone and most datacom installation tasks. Features Futureonics lightweight field crimper tool frame; 2-4-6-position line cord die set (RJ11); 4-position handset cord die set; 8-position line cord set (RJ45); 100 each 4-position handset cord plugs, 4-position line cord plugs and 6-position line cord plugs plus 50 8-position line cord plugs. Durable plastic molded carrying case. Additional components separate.

215X500 MCT-TD-KIT Crimpkit.....1-5, \$449.00 ea.; 6-up, \$399.00 ea.

Modular Cable Checkers



Test Any 2-, 4-, 6- or 8-Wire RJ Type Telco or Data Cable

Instantly evaluate the integrity of any RJ11, RJ45 and DEC MMJ equipped modular (telco or data) cable/connectors with these L-Com pocket-sized testers. Simply by plugging in both cable ends and observing the two color LEDs you can quickly identify both continuity and open conditions. Simultaneously, the color of the LEDs also determines whether the cable is properly wired for data use with straight-through pinning (lights red) or for voice communication with crossed pinning (lights green). Choose from three models: the DX45 for testing RJ45 modular connectors, the DX50 for testing RJ11 modular connectors and the DX50DEC for testing DEC MMJ offset modular connectors. Each model is powered by a single 9-V battery (supplied) and measures only 2.4" x 3.75" x 1.1".



668X045 DX-45 (RJ45-Type).....1-5, \$44.50 ea.; 6-up, \$40.50 ea.

668X050 DX-50 (RJ11-Type).....1-5, 39.50 ea.; 6-up, 36.00 ea.

668X055 DX-50-DEC (DEC-MMJ-Type)..1-5, 44.50 ea.; 6-up, 40.50 ea.

Weidmüller

All-in-One Telephone Tools

Crimp and terminate all three popular modular plug configurations with single versatile field service tools! Each model combines all the necessary tools to cut, strip and crimp modular telephone wires and plugs reliably and effortlessly.

The 1530R uses RJ11 two-, four- and six-position plus RJ45 handset plugs. It cuts and strips telephone cord. Includes a full-cycle ratchet. Weighs 15 ounces. The 1540 works with AMP plugs for stranded and solid wire. It uses RJ11 two-, four- and six-position plus RJ11 DEC (MMJ) and RJ45 handset plugs. Use it to cut and strip telephone cord. Includes a full-cycle ratchet. Weighs 18 ounces. Five-year warranty.

170X082 1530R.....1-11, \$123.50 ea.; 12-up, \$112.00 ea.

170X085 1540.....1-11, 133.00 ea.; 12-up, 120.00 ea.

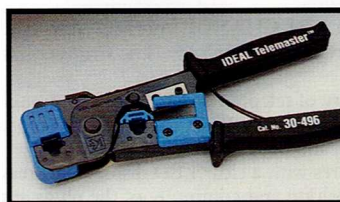


Economy 10BASE-T Kit

A crimper and cable stripper are packaged with modular plugs for job convenience and handy storage. Telemaster™ multi-function telephone tool crimps, cuts and strips for easy, on-the-job, one-tool application. It is designed for RJ-11 (one-, two- and three- pair) and RJ-45 (four-pair) plugs. Crimp primary modular plug strain relief only. Steel frame with black handles gives long-term durability and dependability. Includes Telemaster™ TelCom Crimper 30-496, Cyclops twisted-pair cable stripper 45-514 and 50 RJ-45 eight-position modular plugs. Organized blow-molded case has foam cut-out interior. The 2-pound kit is 11" x 8" x 2". One-year warranty.

370X102 33-750 10BASE-T Kit.....1-11, \$125.00 ea.; 12-up, \$119.00 ea.

270X425 30-496 Crimp Tool Only....1-11, 49.50 ea.; 12-up, 47.00 ea.



2100 Series

New, Compact Crimpers for Modular Plugs

New, compact and lightweight design represents a major breakthrough in crimp tool technology. These 2100 Series Crimpers weigh in at only about 10 ounces and just 7½" inches in length, but they deliver all the power and performance of traditional 10" crimp tools weighing over a pound. Features include high carbon steel frame construction, molded grips and easily interchanged (interlocking) die sets that crimp both the conductor and strain relief in one crimp cycle. Each tool has a life cycle conservatively rated at over 50,000 crimps. Models available for standard RJ11 (two-, four- and six-position) plugs, long body RJ11 (AMP and Western Electric type) plugs, RJ11 (eight position) for keyed or non-keyed (AMP and Western Electric type) plugs and the new 10-position plugs. All dies and frames are interchangeable for maximum convenience.

Complete Tool (RJ-11, Six-Position Plugs)

307X276 2106CT Tool1-5, \$79.00 ea.; 6-up, \$71.00 ea.
307X206 2100-06 RJ11 Six-Position Die Set.....32.00 ea.

Complete Tool (RJ-11, Long-Body, Six-Position Plugs)

307X277 2106LBCT Tool.....1-5, \$79.00 ea.; 6-up, \$71.00 ea.
307X207 2100-06LB RJ11 Six-Position Long-Body Die Set32.00 ea.



SARGENT

Complete Tool (RJ-45, Eight-Position Keyed or Non-Keyed Plugs)

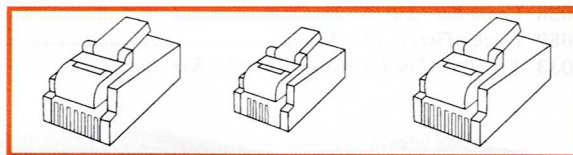
307X278 2108CT Tool1-5, \$79.00 ea.; 6-up, \$71.00 ea.
307X208 2100-8 RJ45 Eight-Position Die Set32.00 ea.
2100 Tool Frame Only
307X2001-5, \$48.00 ea.; 6-up, \$43.50 ea.
307X210 2100-10 10-Position Die Set32.00 ea.

Kit 210

Modular Plug Kit with New Compact Crimper

This special kit is perfect for both in-house and field connectorizing of modular-type plugs. It includes one each of our new compact-design crimp tool frames, a standard 2-4-6 position RJ11 die, a long body 2-4-6 position RJ11 (AMP-type) die, an RJ45 universal die and a 10-position die. Additionally, we've included 50 each RJ45 and 50 each RJ11 premium quality (Stewart) modular connectors in each kit. The Kit 210 is supplied in a very compact, high-impact plastic case that can be easily slipped into a tool kit or drawer.

307X821 Kit 210.....1-5, \$229.00 ea.; 6-up, \$205.00 ea.



Standard Telecom Modular Plugs

Ideal modular plugs are UL/FCC approved for use with round solid cables in data and voice markets. The 85-344 contains RJ-11 four-position plugs. Order 85-345 for RJ-11 six-position plugs. The 85-346 consists of RJ-45 eight-position plugs. Sold 25 per package.

270X380 85-344 Four-Position.....1-11, \$7.00 pkg.; 12-up, \$6.25 pkg.
270X382 85-345 Six-Position1-11, 9.50 pkg.; 12-up, 8.25 pkg.
270X385 85-346 Eight-Position.....1-11, 20.00 pkg.; 12-up, 17.50 pkg.

Universal Twisted-Pair Kit

Comprehensive Modular Plug Kit

The 33-650 Universal Twisted-Pair Tool Kit was designed to terminate any non-coax LAN (Local Area Network) system using twisted-pair cable including 10BASE-T. It contains ALL necessary tools and connectors for installing, reworking, rewiring and repairing twisted-pair cables.

This kit comes complete with the new, low-profile T-Frame crimp tool with dies for RJ45 (keyed and non-keyed), standard RJ11, AMP's special RJ45 and RJ11 (DEC MMJ-type) plus round cable cutter and the innovative CYCLOPS cable stripper for removing outer sheaths of unshielded and shielded twisted-pair cable (including Appletalk) up to 3/8" in diameter.

The 33-650 also includes 50 each of the following modular connectors: RJ11 four-position, RJ11 six-position, RJ11 MMJ (DEC-type) and RJ45 eight-position (non-keyed). Tools come in a 4.8-pound deluxe plastic carrying case measuring 15.5" x 12.25" x 3". One-year warranty. Individual or replacement tools listed below may be purchased separately.

33-650 Universal Twisted-Pair Kit

270X8951-2, \$399.00 ea.; 3-up, \$363.00 ea.

Individual Tools

270X450 27-701 Crimp Frame (T-Frame) Only.....\$58.00 ea.
270X452 27-715 Standard RJ45 Die Set40.00 ea.
270X454 27-716 Standard RJ11 Die Set40.00 ea.
270X458 27-717 Special AMP RJ45 Die Set.....40.00 ea.
270X460 27-718 Special RJ11 MMJ (DEC) Die Set40.00 ea.
270X462 27-719 Special RJ45 10-Position Die Set*40.00 ea.
270X222 45-514 CYCLOPS Cut and Strip Tool38.00 ea.

*Must be ordered separately — not a standard part of the kit.



Butterfly Installation Tool

- Unique 25-pair installation tool
- Designed for field applications

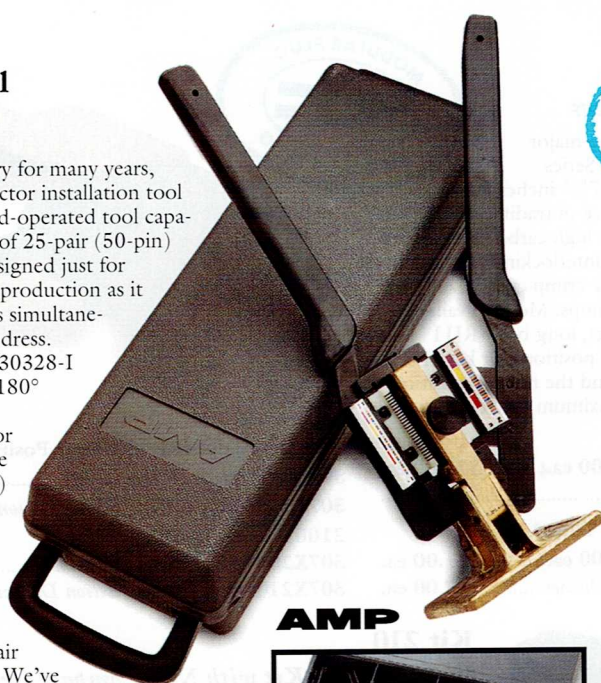
A standard of the telephone industry for many years, this patented and unique AMP® connector installation tool (MI-1 Multi-Insertion) is the only hand-operated tool capable of performing volume installations of 25-pair (50-pin) telephone connectors. It is specially designed just for field applications and medium-volume production as it is capable of terminating all conductors simultaneously up to 50 positions with 90° wire dress.

To operate the tool properly, the 230328-1 Lacing Fixture (used to obtain 90° or 180° wire dress required) and the 230327-1 Comb Kit (keeps the wires separated for maximum ease of use) always should be used. The MI-1 Tool (P/N 229378-1) is supplied in a convenient, durable carrying case with complete operating instructions.

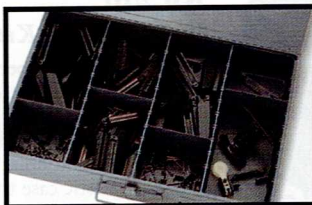
Our very popular Kit 50 50-Pin Telephone Connector Kit is used in conjunction with the Butterfly Installation Tool. It is designed for field repair of 25-pair telephone cable connectors. We've included 20 each male and female connectors (with hoods) plus the patented palm-grip AMP® CHAMP® tool that includes an index slide and cable clamp to assist in the contact to tool alignment when making wire terminations. All components are genuine AMP Incorporated products and come packaged in a deluxe metal box.

MI-1 Tool (229378-1) Butterfly Installation Tool

194X087	1-2, \$699.00 ea.; 3-up, \$675.00 ea.
194X088 Comb Kit (230327-1)	15.50 ea.
194X089 Lacing Fixture (230328-1)	149.00 ea.
194X033 Kit 50 50-Pin Telephone Connector Kit	1-5, \$215.00 ea.; 6-up, \$199.00 ea.



AMP



CHAMP® T-Handle Wire Insertion Tool

Use this tool to insert individual wire into CHAMP® connectors when making repairs. Position side of connector block on suitable support to prevent rolling. Place tool on wire over contact and apply approximately 15 pounds of pressure straight down on the handle. Remove tool and inspect contact for proper wire insertion. Use this tool to replace wire after removing damaged contact with terminal extraction tool.

229384-1 Insertion Tool

194X135 1-11, \$6.00 ea.; 12-up, \$5.50 ea.



ErgoCrimp® Tools

Better Ergonomic Crimpers

- Significantly lower handle force
- Order tool frame only, frame and die set combinations or replacement die sets

Xcelite presents better ergonomic crimping tools. ErgoCrimp® and ErgoCrimp Plus® are the world's most advanced crimping tools available to date. With their new patented design, they deliver up to 50% better mechanical gain than any other kind. With this increase, you get significantly lower handle force, resulting in fewer work-related injuries such as carpal tunnel syndrome as well as an increase in productivity.

Purchase the ErgoCrimp Plus frame by itself without dies or choose either tool in combination with a die set for commonly used connectors. All ErgoCrimp die sets are precision machined, hardened steel to fit ErgoCrimp and ErgoCrimp Plus tools. Choose from three frame and die set combinations. Model ECP-100 consists of an ErgoCrimp Plus tool frame along with a D-100 die set for use with 22-10 AWG red, blue and yellow insulated terminals and splices. The EC-102 is made up of an ErgoCrimp tool frame combined with a D-102 die set for use with RG58, RG59/62 AU BNC/TNC coaxial connectors with .213", .255", .068" hex cavities. Model EC-108 includes an ErgoCrimp tool frame along with a D-108 die set for use with 30-20 AWG open-barrel and D-subminiature pin and socket contacts. Replacement die sets are also available separately.

The 1.1-pound ErgoCrimp measures 8.66" x 2.83" while the 1.2-pound ErgoCrimp Plus measures 10" x 2.83". Lifetime warranty.

108X307 ECP-000 ErgoCrimp Plus Frame Only	1-2, \$ 73.00 ea.; 3-up, \$ 66.00 ea.
108X310 ECP-100 ErgoCrimp Plus Tool with D-100 Die	1-2, 139.00 ea.; 3-up, 125.00 ea.
108X300 EC-102 ErgoCrimp Tool with D-102 Die	1-2, 128.00 ea.; 3-up, 116.00 ea.
108X297 EC-108 ErgoCrimp Tool with D-108 Die	1-2, 139.00 ea.; 3-up, 125.00 ea.
108X295 D-100 Die Set (22-10 AWG) for ECP-100	67.00 ea.
108X290 D-102 Die Set (RG58, 59/62) for EC-102	67.00 ea.
108X285 D-108 Die Set (30-20 AWG) for EC-108	91.00 ea.

Xcelite®



Lcom

Models DXB3 and DXB4 Coaxial Cable Testers

L-com's DXB3 and DXB4 Coaxial Cable Testers offer effective and inexpensive continuity testing of coaxial cabling where the user has access to both ends. They are especially useful during bench top testing of patch cords, and adapters are available to check cabling terminated by connectors other than BNCs. Both models are equipped with two BNC jacks, LED display and 9-V battery. The economical DXB3 offers tests for shorts and opens only. Simply plug both ends of the cable into the jacks and verify the results on the LEDs. The DXB4 also includes exclusive circuitry to lock on to intermittent shorts that are a common problem in coaxial terminations.

Each unit measures 3" x 2.4" x 1.1". One-year warranty.

DXB3 Economy Coax Cable Tester

668X080 1-11, \$24.00 ea.; 12-up, \$22.00 ea.

DXB4 Intermittent Cable Tester

668X084 1-11, \$35.00 ea.; 12-up, \$31.50 ea.



SHATTUCK
INDUSTRIES



Toggle™ Coaxial Stripping Tools

The World's Best Coax Stripping Tools

Shattuck Industries' Toggle tools are the best coax strippers available anywhere. These exceptional tools are the simplest and most effective way ever devised to handle even the most complex coax stripping jobs. Each Toggle makes one-level, two-level and three-level strips with a simple spinning action. And the entire process takes only seconds to complete.

Toggle eliminates trial and error stripping. They are pre-adjusted at the factory so precision strips can be made right away. The compact, lightweight design is convenient even in the tightest spots and it will strip cable to any configuration. Each Toggle comes with pre-installed, pre-adjusted, two-sided hollow ground, stainless steel blades that eliminate adjusting. You can be confident that the blades are always properly aligned and set.

Each 3-inch tool weighs 1.25 ounces and comes with a one-year warranty. Toggles are available in six configurations: RG58, RG59, RG62AU, RG8/11U, Ethernet Thickwire and RG58 Thinnet Plenum.

Stock No.	Part No.	Description	Prices	
			1-11	12-up
270X200	45-508	RG58 Coax Stripper	\$38.00	\$35.75
270X204	45-517	RG59 Coax Stripper	38.00	35.75
270X208	45-518	RG62AU Coax Stripper	38.00	35.75
270X215	45-510	RG8/11U Coax Stripper	38.00	35.75
270X218	45-516	Ethernet Thickwire Stripper	38.00	35.75
270X220	45-515	RG58 Thin Plenum Stripper	38.00	35.75

CST-Vario Adjustable Coax Stripper

Paladin's adjustable two- or three-level blade cassette-style coax stripper is easy to use with all popular coaxial cables from 0.1-0.315 inches in diameter.

Strip lengths are adjustable in 1-mm increments. Simply place coax cable in the slot, snug the cam-adjustable rollers against the cable, adjust the blades for desired strip level, and rotate the stripper around the cable until strip is completed. Additional blade cassettes and interchangeable blade holders are available for different strip configurations. One-year warranty.

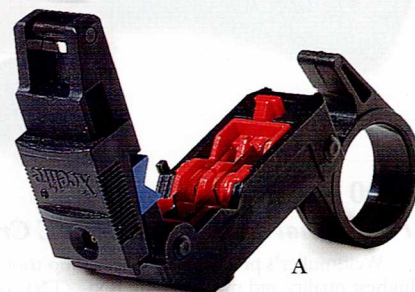
170X540	3240 Coax Stripper	1-11, \$59.00 ea.; 12-up, \$53.50 ea.
170X542	3242 Blade Holder	30.50 ea.



Weidmüller



B



A

Xcelite®

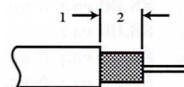
Coaxial Wire Strippers

The fastest, most accurate coaxial cable stripping system available. Most all coaxial cable from .07" to .30" (RG178 up to RG6) can be stripped in seconds with this Xcelite stripping system. By choosing the proper two- or three-step stripping tool, you can remove dielectric, braid and outside insulation simultaneously or in any combination. Simply insert the cable into the cassette to the desired length. Close, then revolve the stripper around the cable until desired cuts/strips are accomplished.

A. Two-Step Models

Designed to strip all single or double-shielded coax cables effectively for solder style, wrench tight or screw-on type connectors. Works well on RG58, RG59, RG62, RG122, RG142, RG174 and 8281 type coaxial cable.

Two-Step



1. Determined by how far operator inserts coax through tool.
2. Determined by color-coded cassette strip dimensions.

2CS5962-B — Blue cassette model for solder and fast fit-type BNC connectors. The "2" dimension is .27".

108X956 Complete Tool 1-11, \$58.50 ea.; 12-up, \$53.00 ea.

108X950 2C-B Repl. Cassette 24.00 ea.

2CS5962-R — Red cassette model for F connectors and square cut BNC connectors. The "2" dimension is .24".

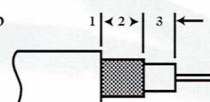
108X958 Complete Tool 1-11, \$58.50 ea.; 12-up, \$53.00 ea.

108X952 2C-R Repl. Cassette 24.00 ea.

B. Three-Step Models

Designed to strip all coaxial cables effectively with O.D. of .14" to .30" that require crimp-type coaxial connectors. These three-bladed tools remove dielectric, braid and outside insulation either simultaneously, separately or in any combination. (Do not use three-step tools on RG62 or foam dielectrics. Refer to two-step tools above.)

Three-Step



1. Determined by how far operator inserts coax through tool.
2. Determined by color-coded cassette strip dimensions.
3. Determined by cassette type.

3CS5859-BR — Brown cassette model for BNC/TNC crimp-type coaxial connectors. The "2" dimension is .328"; the "3" dimension is .109". Covers strip lengths 1/16"-7/64".

108X966 Complete Tool 1-11, \$62.00 ea.; 12-up, \$56.00 ea.

108X962 3C-BR Repl. Cassette 29.00 ea.

3CS5859-GN — Green cassette model for BNC/TNC crimp-type coaxial connectors. The "2" dimension is .235"; the "3" dimension is .235". Covers strip lengths 13/64"-1/4".

108X968 Complete Tool 1-11, \$62.00 ea.; 12-up, \$56.00 ea.

108X964 3C-GN Repl. Cassette 29.00 ea.



Weidmüller **1600 Series****Professional-Quality BNC/TNC Crimp Tools**

Weidmüller's professional series crimp tools are recognized as the industry's highest quality and most reliable BNC/TNC crimpers. They are designed and built to deliver maximum crimping efficiency and day-in, day-out reliability.

Imagine, a single tool that can accommodate seven different crimps simply by changing the die sets! Every 1600-type tool features a long-life steel body (50,000+ crimp cycles), comfortable plastic grip handles, precision die sets and a safety release. Each has been manufactured to exceed MS-39012 specifications for type BNC and TNC coaxial connectors. In fact, Weidmüller utilizes an exact milling and hardening process that ensures the most precise crimping possible. These tools are designed for use with connectors made by Amphenol, Trompeter, AMP, Kings, Cambridge, Delta and AVA and are in most cases much less expensive and of higher quality than original factory tooling. All die sets and tool frames interchange.

Complete Tools

170X090	1610 (RG58)	.....1-5,	\$88.00 ea.;	6-up,	\$79.50 ea.
170X100	1615 (RG59/RG62)	.....1-5,	88.00 ea.;	6-up,	79.50 ea.
170X105	1616 (RG174)	.....1-5,	88.00 ea.;	6-up,	79.50 ea.
170X108	1617 (RG58/RG59)	.....1-5,	88.00 ea.;	6-up,	79.50 ea.
170X115	1621 (Belden 8281)	.....1-5,	88.00 ea.;	6-up,	79.50 ea.
170X080	1600 (Frame only)	.....1-5,	57.50 ea.;	6-up,	46.50 ea.

Replacement Die Sets

170X220	2001 (RG58)	.....	\$34.50 ea.
170X222	2002 (RG59/RG62)	.....	34.50 ea.
170X226	2005 (RG58/RG59/RG62 Combo)	.....	34.50 ea.
170X230	2009 (Belden 8281)	.....	34.50 ea.

Weidmüller **Weidmüller "Econocrimper" Coax Tools**

This unique series of full-cycle ratcheted tools is specially designed to offer unprecedented low cost in professional-quality crimp tools. Weidmüller's Econocrimp tools are designed for the occasional use of service organizations, one-time installations and even small production runs. They deliver the same precision crimp of tools costing much more. Other features include an all-steel body, dual nest (stamped) precision dies made to deliver an ovalized barrel crimp and insulation support in one smooth action, color-coded dies to AWG specifications and a safety release. They are made to meet or exceed all applicable UL standards.

Choose from three models. The 1317 crimps RG58, 59 and 62AU (BNC and TNC) three-piece MS39012-type connectors. Use the 1319 to crimp MS39012-type "N-series" plugs and jacks for RG8/11, RG213 and RG216 cable. The 1328 crimps RG59 and RG6 captive ring "F" connectors. Five-year warranty.

170X065	1317 (RG58/59/62AU)	.....1-5,	\$48.00 ea.;	6-up,	\$43.50 ea.
170X067	1319 (RG8/11 "N-Type")	.....1-5,	48.00 ea.;	6-up,	43.50 ea.
170X070	1328 (CATV "F-Type")	.....1-5,	48.00 ea.;	6-up,	43.50 ea.

AMP**RG58 and RG59/62 Coax Connector Kits**

Here are two very popular service kits from AMP® Incorporated. Choose from our Kit 58 of RG58 connectors and Kit 59 of RG59/RG62 connectors. Each set includes 20 BNC-type AMP connectors (50 Ω) with 20 ferrules and 20 contacts plus manual crimp tool, all packaged in a convenient metal storage box. Manual crimpers also may be purchased separately.

194X058	Kit 58 (RG58-Type)	.....1-5,	\$124.00 ea.;	6-up,	\$115.00 ea.
194X059	Kit 59 (RG59/62-Type)	.....1-5,	124.00 ea.;	6-up,	115.00 ea.
194X390	220146-1 (RG58 Only)	.....1-5,	31.00 ea.;	6-up,	28.50 ea.
194X391	220147-1 (RG59/62 Only)	.....1-5,	31.00 ea.;	6-up,	28.50 ea.

Coaxial Cable Checker**Tests all BNC, TNC and Wang Terminated Cables**

Finally, a quick way to identify good or bad coax cables terminated with BNC, TNC or a combination of both (as used by Wang). L-Com's new DX35A test set identifies a short circuit condition between the center conductor and shielding (by a red illumination) or a good and usable cable (by a green illumination). Other features include a push-button switch that changes the test mode from short/open or continuity and terminators that allow testing of cables that are already installed. Small in size, its high-impact case measures only 3.75" x 2.5" x 1". It is powered by a 9-V battery (supplied) and comes complete with a deluxe carrying case.

668X035	DX-35A Coax Tester1-5,	\$64.00 ea.;	6-up,	\$58.00 ea.
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**L-com****NEXT-DAY DELIVERY
ONLY \$14.95!**



Crimpmaster™ RG 58/59 Combo Kit Complete Coax Crimp Kit

Coaxial crimping kit specifically for RG-58 and RG-59 coax crimping applications. Includes Model 50-2009 Industrial RG-58/59 Crimp Tool, Model 46-5806 three-step Pro-Ax Coax Stripper, 10 each RG-58 and RG-59 male BNC connectors plus five each RG-58 and RG-59 blue and black strain-relief boots. Blow-molded case with foam cut-out interior. The 3-pound kit is 10.6" x 7.8" x 2.5". Lifetime warranty.

370X094 33-303 Crimping Kit1-2, \$152.00 ea.; 3-up, \$143.00 ea.



RG58/59/62AU Industrial Crimp Tool

Low-cost, industrial ratcheted crimper for RG58, RG59/62AU BNC/TNC three-piece hex MS39012 type connectors made by Amphenol, AVA, Aim, Cambridge, Delta, Kings, Trompeter and AMP. Full-cycle, compound leverage and triple ratcheted for precision. High-grade stamped-hardened steel frame with ergonomic handle and built-in safety release. Dual-nest, precision-die cast crimp dies are hardened for proper crimp. Triple hex cavity die is incorporated in this tool with crimp dimensions of .255, .213 and .068.

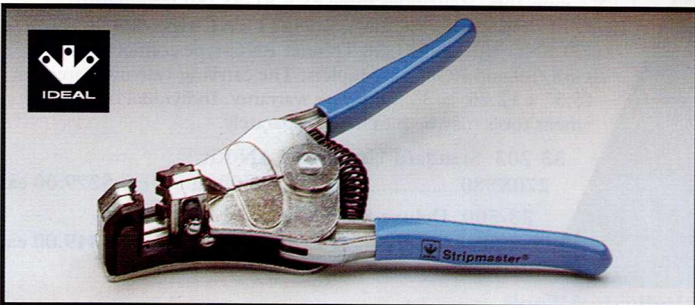
270X325 30-502 Crimp Tool.....1-11, \$53.00 ea.; 12-up, \$50.00 ea.



RG58/59/62AU Coax Wire and Cable Stripper

Use three-blade PRO-AX stripper for three-piece BNC/TNC coax connectors on RG58, RG59/62, RG6, Belden 8281 and RG58 Thin-net Plenum cables. Made of injection-molded thermoplastic with built-in tension spring, center conductor cutter and slide adjustment. Small, lightweight, innovative tool easily makes strips in dimensions of .240 and .240.

270X250 45-520 Stripper.....1-11, \$33.00 ea.; 12-up, \$30.50 ea.



Coax Stripmaster® Wire Strippers

Spring-action stripping grips and strips in one motion. Knife-type blades feature multiple hole diameters sized for removing outer and inner insulations. Choose from models that strip RG-6, RG-58, RG-59 or RG-62 coax.

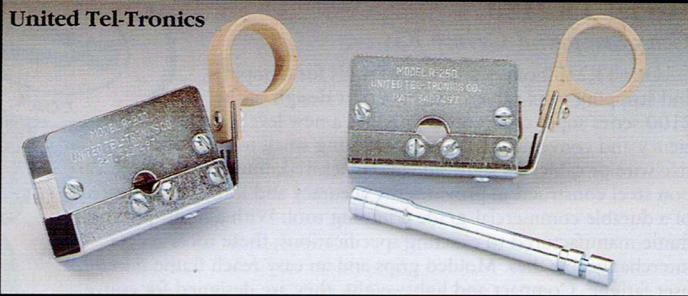
370X282 45-262 (for RG-6).....1-11, \$28.00 ea.; 12-up, \$25.50 ea.

370X284 45-264 (for RG-58).....1-11, 28.00 ea.; 12-up, 25.50 ea.

370X285 45-265 (for RG-59).....1-11, 28.00 ea.; 12-up, 25.50 ea.

370X286 45-266 (for RG-62).....1-11, 28.00 ea.; 12-up, 25.50 ea.

United Tel-Tronics



Cable Strippers

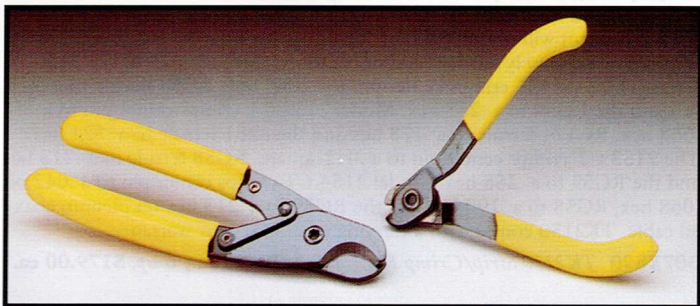
These cable preparation tools provide speedy, simultaneous, accurate cutting of jacket, shield and dielectric. They prepare cable for use on proper fittings and assemblies used in networks, communications, television antenna systems, etc. Field adjustments are easy. Just loosen pressure screws slightly and adjust blade(s) as desired. Setting gauges allow blade spacing in increments of 1/8" and 1/16" with depths for jacket, shield and dielectric stripping requirements. These cable strippers use inexpensive, single-edge razor blades. Choose from models that strip RG-58 Coax, RG-59 or RG-62 Coax, Twinax or Ethernet cable.

219X100 R-100 (for RG-58 Coax)1-11, \$32.00 ea.; 12-up \$29.00 ea.

219X200 R-200 (RG-59/62 Coax)1-11, 29.00 ea.; 12-up 26.50 ea.

219X250 R-250 (for Twinax).....1-11, 47.50 ea.; 12-up 43.00 ea.

219X300 R-300 (for Ethernet).....1-11, 53.50 ea.; 12-up 48.50 ea.



Coax Cable Cutter

This round cable and wire cutter cuts coaxial cable up to RG9U, multi-conductor cable up to .005" and solid or stranded wire up to #8 AWG. Has built-in return spring, locking latch and soft handles for comfortable grip. Stamped, hardened steel frame has curved cutting blades.

270X625 35-051 Cable Cutter.....1-11, \$21.00 ea.; 12-up, \$19.50 ea.

Coax Center Conductor Trimmer

The 85-0026 trims the coax center conductor to the exact length for proper assembly of the center pin to the conductor. It will cut conductors on RG174-RG8/11 Ethernet solid or stranded wire.

270X628 35-060 Trimmer.....1-11, \$12.00 ea.; 12-up, \$11.00 ea.



BNC/TNC Connector Removal Tools

These BNC/TNC Connector Removal Tools provide easy access to high-density locations of connectors. Choose from three sizes. The 35-042 is 12 inches long with an 8-inch blade. The 35-043 is 16 inches long with a 12-inch blade. The 35-041 is 8 inches long with a 4.5-inch blade.

270X607 35-042 (12").....1-11, \$20.00 ea.; 12-up, \$18.50 ea.

270X608 35-043 (16").....1-11, 20.00 ea.; 12-up, 18.50 ea.

270X610 35-041 (8").....1-11, 20.00 ea.; 12-up, 18.50 ea.



Model TK2150 Coax Strip and Crimp Kit

Our TK2150 offers a variety of tools for crimping and stripping coax cables. The compact design of the 2100 series super crimp tools provides a new level of efficiency and convenience when terminating small to medium size wire or cable. Its state-side manufactured, fine-blanked high-carbon steel construction provides the accuracy and longevity expected of a durable commercial-grade crimping tool. With a multi-purpose frame manufactured to exacting specifications, these tools accept interchangeable dies. Molded grips and an easy-reach frame minimize user fatigue. Compact and lightweight, they are designed for convenient handling of wire and contact. The 2100 series has a cyclic life rated at 50,000 crimps. Interlocking die sets are easily interchanged with mounting screws on most product applications.

Our TK2150 comes with four of the 2100 series of tools. The 2100-51 crimps the center pin to a .068 hex, RG58 ferrule to a .213 hex and the RG59 ferrule to a .255 hex. Model 2100-52 crimps the center pin to .068 hex, the RG174 ferrule to a .178 hex and the 8281 ferrule to a .324 hex. The 2100-53 crimps center pin to .042 square, the RG58 to .213 hex and the RG59 to .255 hex. Model 2100-54 crimps the center pin to a .042 or .068 hex, RG58 ferrule to a .190 hex and the RG59 ferrule to a .213 hex on plenum coaxial cable. Also included as part of the TK2150 is the 8300 Easy-Strip. The Easy-Strip tools are the most cost-effective coax cable preparation tools available. These strippers have a molded in place cutting blade which provides clean, accurate nick-free cuts. The 8300 Easy-Strip is user friendly and may be suitable for other types of jacketed cable. Its three cavities prep the jacket, expose the braid only and the center conductor on RG58, 59 and 62 coaxial cable. Braid cut will remove the jacket and braid only. Jacket cut will not nick the braid.

Offered separately are four additional tools which are part of the 2100 series. The 2151 CT crimps center pin to a .068 hex, RG58 ferrule to a .213 hex and the RG59 to a .255 hex. Model 2152 CT crimps center pin to a .068 hex, RG174 ferrule to a .178 hex and the 8281 ferrule to a .324 hex. The 2153 CT crimps center pin to a .042 square, RG58 ferrule to a .213 hex and the RG59 to a .255 hex. Model 2154 CT crimps center pin to a .042 or .068 hex, RG58 to a .190 hex and the RG59 to a .213 hex on plenum coaxial cable. TK2150 comes with a carrying case. One-year warranty.

307X890 TK2150 Strip/Crimp Kit....1-5, \$199.00 ea.; 6-up, \$179.00 ea.



TK2150 SUPER CRIMP SYSTEM		CRIMPING TOOL		DIE SET		CABLE		Crimp	
Model	Die Set	Tool	Die Set	Cable	Crimp	Model	Die Set	Tool	Crimp
2100-51	RG58, RG59, 8281	2100-51	RG58, RG59, 8281	RG58, RG59, 8281	2100-51	RG58, RG59, 8281	RG58, RG59, 8281	2100-51	RG58, RG59, 8281
2100-52	RG58, RG59, 8281	2100-52	RG58, RG59, 8281	RG58, RG59, 8281	2100-52	RG58, RG59, 8281	RG58, RG59, 8281	2100-52	RG58, RG59, 8281
2100-53	RG58, RG59, 8281	2100-53	RG58, RG59, 8281	RG58, RG59, 8281	2100-53	RG58, RG59, 8281	RG58, RG59, 8281	2100-53	RG58, RG59, 8281
2100-54	RG58, RG59, 8281	2100-54	RG58, RG59, 8281	RG58, RG59, 8281	2100-54	RG58, RG59, 8281	RG58, RG59, 8281	2100-54	RG58, RG59, 8281

SARGENT



Individual Tools

307X300	2151CT Coax Crimper, RG58 and RG59.....	\$80.00 ea.
307X305	2152CT Coax Crimper RG174 and 8281.....	80.00 ea.
307X306	2153CT Coax Crimper, RG58 and RG59.....	80.00 ea.
307X307	2154CT Coax Crimper, Plenum.....	80.00 ea.



Universal LAN Kits for Coax

The Most Complete Coax Kits Available

Our Universal LAN kits are designed to ensure LAN installation and repair technicians, MIS departments and designers that they have everything needed to cut, strip and terminate virtually any style of LAN system using coax connectors.

The 6-pound standard kit 33-203 includes a three-blade coax cable stripper (brown cassette), Ethernet (Thickwire and DEC-Thinnet) cable strippers, industrial crimp tool with dies for standard RG58, RG59/62, RG8/11 (Thickwire Ethernet) and RG58 round coax (DEC Thinnet type) plus cable cutter, center conductor trimmer and round cable slitter.

Our 7-pound deluxe 33-500 is upgraded with an assortment of LAN connectors. It includes three each RG58/59 terminators; RG8/11 (Thickwire Ethernet), RG8/11 TNC-type, RG58/59 "T", RG59 BNC-type and RG58 Thinnet BNC-type connectors; plus RG58/59 and RG8/11 couplers. The carrying case measures 15.5" x 12.25" x 3". One-year warranty. Individual or replacement tools may be purchased separately.

33-203 Standard Universal LAN Kit

270X880.....1-2, \$295.00 ea.; 3-up, \$279.00 ea.

33-500 Deluxe Kit with Connectors

270X885.....1-2, \$375.00 ea.; 3-up, \$349.00 ea.

Individual Tools

270X218	45-516 Ethernet (Thickwire) Stripper.....	\$38.00 ea.
270X220	45-515 RG58 (Thinnet) Toggle Stripper.....	38.00 ea.
270X260	45-521 Pro-Ax Coaxial Cable Stripper.....	32.00 ea.
270X320	30-506 Industrial Crimp Tool (Frame Only).....	37.00 ea.
270X340	30-581 RG58 and RG59/62 Die Set.....	21.00 ea.
270X346	30-577 RG8/11 (Thickwire) Ethernet Die Set.....	21.00 ea.
270X360	30-588 AMP RG58 (Thinnet) Ethernet Die Set.....	21.00 ea.
270X600	45-144 Round Cable Slitter Tool.....	40.00 ea.
270X625	35-051 Coax Cable Cutter.....	21.00 ea.
270X628	35-060 Coax Center Conductor Trimmer.....	12.00 ea.





Weidmüller

1631/1645

For Open Barrel Contacts

- Crimp range of 14-30 AWG
- Designed for RS-232-type contacts
- Economically priced

A unique straight-sided die design enables users to crimp virtually any open barrel contact. Highly versatile, it crimps pins, sockets, spring contacts and open barrel slide-ons made by AMP, Molex, Burndy, Sourieau, TRW, Cinch, ITT, Cannon, Amphenol and Waldon.

The 1631 has a crimp range of 24-14 gauge. The 1645 crimps smaller wire sizes: 30-18 gauge. These are precision tools that work efficiently at a cost which is half that of factory crimping tools. The 1645 is particularly useful when working with RS-232-type connectors.

170X122 16311-5, **\$133.00 ea.**; 6-up, **\$120.00 ea.**
170X125 16451-5, **108.00 ea.**; 6-up, **97.50 ea.**



Weidmüller

1440/1441

Four-Way Indent Crimping Tools

- Designed to meet MS-22520
- Built-in locators
- Unbelievably priced at only \$29

Weidmüller's Crimp Tools are designed for crimping solid barrel, D-sub-miniature contacts used with RS-232 interface connectors. Full-cycle ratcheting tools comply fully with Mil Spec MS-22520 requirements for crimping cable connectors. Compact (measuring only 6½") and spring loaded with built-in locators that make alignment and subsequent crimping very fast and simple. And unlike expensive factory tooling made by connector manufacturers, these tools are realistically priced. The 1440 crimps 26- to 20-gauge AWG. Use the 1441 for 20- to 12-gauge AWG. Five-year warranty.

170X075 1440 Crimp Tool1-5, **\$31.50 ea.**; 6-up, **\$28.50 ea.**
170X086 1441 Crimp Tool1-5, **31.50 ea.**; 6-up, **28.50 ea.**



SARGENT

A

JONARD
INDUSTRIES CORP.

AMP

B

Open Barrel Type Crimp Tools

Designed to crimp AMPLIMITE® precision-formed size 20 loose-piece (LP) pin and socket contacts found in most DB-25 connectors (RS-232 type). Choose from two tool versions. The high-volume ratcheting model is made for pin/socket crimping, and the hand tool can accommodate pins/sockets as well as insulated terminals.

A. Ratcheting Crimp Tool

For relatively high-volume field repairs or installations of open barrel contacts. This tool features two crimper jaws, two anvil jaws, two crimp sections (color coded), a moveable contact locator, a wire stop, a ratchet to ensure full contact crimping and spring-actuated handles with cushion grips.

307X860 SP-1364 Ratcheting Tool1-5, **\$90.00 ea.**; 6-up, **\$82.50 ea.**

B. Service Tool II

An AMP exclusive. Designed to crimp open and closed uninsulated terminals and insulated terminals from 22-10 AWG. A very versatile tool, it can size studs and wire, cut bolts and has a special notch for Flag Tab-Lock Faston Terminals. It is made of durable carbon steel and features cushion grip handles for maximum operator comfort. Will crimp sockets/pins (RS-232-type) in low volume applications.

194X170 90330-1 Service Tool II1-11, **\$45.00 ea.**; 12-up, **\$41.50 ea.**



Connector Insertion/Extraction Tools

These kits provide invaluable assistance to the technician. They include specialized tools required for the insertion and removal of the most popular connectors, all contained in a small handy case. Designed for use with sub-miniature connectors conforming to MIL-C-26482 and MIL-C-26500 standards, these kits include the most common and popular tools in the industry. They are completely compatible with original manufacturer tooling from all major suppliers such as AMP®, Amphenol, Bendix, Burndy, Cannon and Deutsch and will work with virtually any connector of this type.

The KA-260 Insertion Kit includes the three most popular sized insertion tools for contact sizes 12 (yellow), 16 (blue) and 20 (red). The KR-260 Extraction Kit includes the three most popular sized extraction tools for contact sizes 12 (yellow), 16 (blue) and 20 (red). Both kits are packaged in an attractive and durable padded zipper case and have been carefully designed to save both time and effort plus ensure efficient, on-the-job operation.

054X460 KA-260 Insertion Kit1-5, **\$108.00 ea.**; 6-up, **\$99.00 ea.**
054X464 KR-260 Extraction Kit1-5, **127.00 ea.**; 6-up, **117.00 ea.**



Connector Kit 125

Use our most complete AMP® connector kit to repair, replace and field-connectorize nine-, 15-, 25- and 37-pin RS-232 and RS-449 sub-miniature connectors easily and quickly. All necessary components are included. This convenient package is a must for every technician with computer site management responsibilities that involve datacom cable installation and repair.

Kit 125 features 90330-1 Service Tool and 91285-1 Insertion/Extraction Tool. Individual compartments clearly identify the following component parts. You get 100 sockets, 100 pins, 12 receptacles (three each nine-, 15-, 25- and 37-position), 24 plugs (six each nine-, 15-, 25- and 37-position) plus 24 cable clamps (six each nine-, 15-, 25- and 37-position). All these tools and components are organized in a sturdy, durable metal box.

194X420 Kit 125.....1-5, \$179.00 ea.; 6-up, \$165.00 ea.

AMP

AMP RS-232 Connector Kit

Complete kit of components to repair existing or fabricate new RS-232-type cases. Contains 12 hood assemblies with hardware, 18 plug (male) and six receptacle (female) 25-pin connectors, 100 pins and sockets plus insertion/extraction tool. Use in computer room maintenance and prototype assemblies. Sturdy metal box identifies each part. Order Crimp Tool separately.

787053-1 RS-232 Connector Kit

194X400.....1-5, \$86.00 ea.; 6-up, \$80.00 ea.
194X085 206472-1 25-Pin Hood Assembly (6/pkg.).....15.25 ea.
194X070 205207-1 25-Pin Receptacle (6/pkg.).....11.00 ea.
194X074 205208-3 25-Pin Plug (6/pkg.).....11.00 ea.
194X492 1-66506-0 Size #20 Pin (100/pkg.).....12.00 ea.
194X490 1-66504-0 Size #20 Sockets (100/pkg.).....19.00 ea.
194X820 91067-2 Insertion/Extraction Tool..1-24, 5.00 ea; 25-up, 4.50 ea.

2100 Series

Super Crimp Tools

Multi-purpose frames are manufactured to exacting specifications to accept interchangeable dies. Molded grips and easy-reach frames minimize user fatigue.

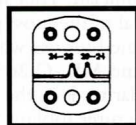
Compact, lightweight design allows convenient handling of wire

and contact. Cyclic life is conservatively rated at 50,000 crimps.

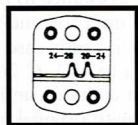
Interlocking die sets are easily interchanged with mounting screws.

The 2124 CT crimps high-density D-Sub pin and socket open barrel contacts. Locator and wire stop orient contact during crimping. Produce conductor and insulation crimps in one tool closure. Conductor crimps are B type; insulation crimps are oval type and produced in two cavities. The 2127 CT crimps D-Sub open barrel contacts. Locator and wire stop orient contact during crimping. Conductor and insulation crimps will crimp to O.E.M. specifications in one tool closure. Conductor crimps are B type; insulation crimps are oval type and produced in two cavities.

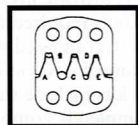
Model 2126 CT crimps a wide variety of open barrel contacts including D-Sub in small size wire ranges. Crimps conductor and insulation in separate cavities. Close tool twice to terminate. Produce oval type insulation crimps in two cavities. Produce B type conductor crimps in three cavities. Die set is pinned in place. The 2128 CT crimps a wide variety of open barrel contacts in medium size wire ranges. Crimps conductor and insulation in separate cavities. Close tool twice to terminate. Insulation crimps are B type and produced in two cavities. Conductor crimps are B type and produced in three cavities. Die set is pinned in place. One-year warranty. Die sets also available.



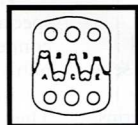
2124



2127



2126



2128

307X284 2124 CT D-Sub 22-30.....1-5, \$97.00 ea.; 6-up, \$89.50 ea.
307X287 2127 CT D-Sub 18-30.....1-5, 97.00 ea.; 6-up, 89.50 ea.
307X286 2126 CT Open Barrel.....1-5, 75.00 ea.; 6-up, 69.00 ea.
307X288 2128 CT Open Barrel.....1-5, 75.00 ea.; 6-up, 69.00 ea.
307X224 2100-24 Die Set for D-Sub or Open Barrel.....51.00 ea.
307X227 2100-27 Die Set for D-Sub or Open Barrel.....51.00 ea.
307X226 2100-26 Die Set for Open Barrel.....30.00 ea.
307X228 2100-28 Die Set for Open Barrel.....30.00 ea.

SARGENT



9100FCC

Flat Cable Crimp Tool

This full-cycle tool is designed to crimp a wide variety of insulation displacement connectors onto flat cable up to a width of 60 conductors. Inserts orient most commercially available connectors.

The shut height is adjustable to compensate for different connector configurations. A ratchet assures full cycle

operation. The ratchet release lever allows the tool to be opened before the crimping cycle is completed if necessary.

For flat cable connector crimping, open the tool fully with the adjustment knob. Install the optional insert or use the flat face insert. Slip an open connector into the tool. Squeezing the handles, adjust the knob for a snug fit. Remove the connector and advance the ram. Pre-assemble the connector and cable and install in the tool before completing the crimp.

For flat cable cutting, use the adjustment screw to open the tool. Install blade holder in ram and flat faced insert in the anvil. Close the tool. Position the cable in the center of the tool. Squeeze handles to make the cut.

An optional 9100CC Cable Guide and Cutter insert is available for cable cutting. One-year warranty.

9100FCC Cable Crimp Tool
307X5001-5, \$127.00 ea.; 6-up, \$117.00 ea.
9100CC Cable Guide/Cutter
307X512.....1-5, \$45.00 ea.; 6-up, \$41.50 ea.





Ratchet Crimp Tool

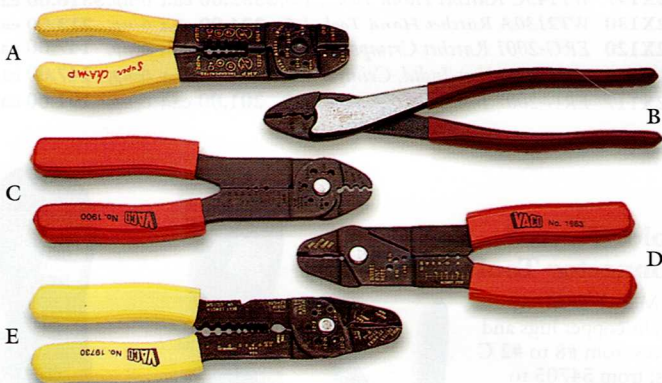
Does the work of up to three tools. Crimps both insulated and bare terminals and splices, wire sizes 22 to 10 AWG. Ratchet action prevents release prior to crimp completion and ensures uniform crimps — no over or under-crimping to result in dielectric failure or pullouts. Compact 9" long.

370X460 83-001.....1-3, \$109.00 ea.; 4-up, \$103.00 ea.

Heavy-Duty Crimp Tool

A heavy-duty crimp tool with rotating forged steel crimp nests. Saves time and money. No die changing, just dial the proper crimp nest for #8, #6, #4 or #2 uninsulated terminals. Wire sizes, both decimal and metric, plainly marked on each crimp nest. Cushioned grips are easy on the hands. Strong nickel chrome-plated handles add appeal and are built to take it.

370X465 83-005.....1-3, \$316.00 ea.; 4-up, \$298.00 ea.



Crimping/Stripping Tools

A. AMP® 47100-1 SUPER CHAMP®: Crimp tool for uninsulated terminals and connectors is standard in virtually all our field service tool kits. Cuts and strips wire; shears bolts and machine screws. Measures 7.5" long.

194X200 47100-1 Super Champ.....1-11, \$13.00 ea.; 12-up, \$12.00 ea.

B. Klein 1005 HD Crimp Tool: Very popular crimp tool designed for crimping insulated and uninsulated connectors (10-22 AWG). Features cushion grip handles, wire cutter and thin nose that permits operation in confined spaces. Measures 9.75" long.

060X480 1005 HD Crimp Tool.....1-11, \$22.75 ea.; 12-up, \$20.50 ea.

C. Klein 1900 Standard Tool: Designed for use with non-insulated solderless terminals. Features stripping and crimping dies (10-22 AWG), bolt-cutting dies (sizes 4-40, 5-40, 6-32, 10-24 and 10-32) plus oversized cushion-grip handles. Measures 8.25" long.

578X120 1900 Crimp Tool.....1-11, \$16.00 ea.; 12-up, \$14.50 ea.

D. Klein 1963 Combo Tool: Features combination crimping dies for use with insulated and non-insulated terminals. Includes stripping and crimping dies (10-22 AWG), bolt-cutting dies (sizes 4-40, 5-40, 6-32, 8-32, 10-24 and 10-32) and oversized cushion-grip handles. Measures 8.25" long.

578X124 1963 Crimp Tool.....1-11, \$17.00 ea.; 12-up, \$15.50 ea.

E. Klein 19730 Wire Plier: Handles a wide variety of wiring jobs. Crimps and strips insulated and non-insulated terminals (8-22 AWG) plus 7- and 8-mm ignition terminals. Cuts bolt sizes 4-40, 6-32, 8-32, 10-24 and 10-32. Strips 6-22 AWG cable. Comes complete with measuring guides for strip length and oversized cushion-grip handles. Measures 9.25" long.

578X150 19730 Wire Plier.....1-11, \$22.00 ea.; 12-up, \$20.00 ea.



Weidmüller

Economy Crimp Tools

Unique ratcheting crimp tools at unprecedented low prices. Designed for small production runs, prototype labs and especially service applications not requiring the day-in, day-out durability of professional-duty crimp tools. Features include sure-grip handles, color-coded dies and all-metal construction. Crimps meet or exceed UL standards. Choose from two models.

A. Maxi-Crimper 1305: Designed to crimp insulated terminals 22-12 AWG. Includes all insulated red, blue and yellow terminals.

170X072 1305 Maxi-Crimper.....1-5, \$48.00 ea.; 6-up, \$43.50 ea.

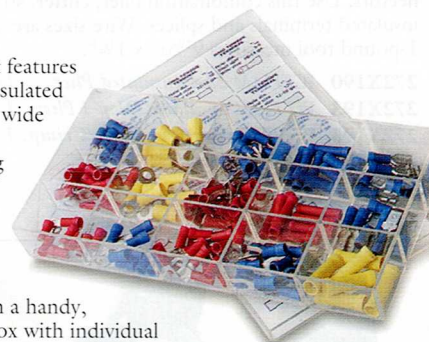
B. Mini-Crimper 1605: Designed to crimp insulated 22-14 AWG terminals and splices made by AMP, T&B, ETC, Hollingsworth, Panduit, 3M, Vaco and Burndy.

170X084 1605 Mini-Crimper.....1-5, \$88.00 ea.; 6-up, \$79.50 ea.

Serviceman's Kit

This terminal connector kit features 15 assorted popular types of insulated terminals and connectors for a wide variety of applications. Klein's 89976 includes six sizes of ring tongue terminals, four sizes of spade type terminals, three sizes of butt connectors and two sizes of Quick-Connect straight terminals (six to 10 pieces of each). All packaged in a handy, reusable clear-plastic storage box with individual compartments for each terminal size.

060X985 89976 Serviceman's Kit1-11, \$17.00 ea.; 12-up, \$15.50 ea.



Deluxe Terminal Kit

Klein's 4800 Deluxe Terminal Kit features a comprehensive assortment of 20 popular types of insulated bell-mouth terminals and connectors along with an all-purpose crimp tool. You get eight sizes of ring tongue terminals, five sizes of spade-type terminals, three sizes of butt connectors and four sizes of Quick-Connect straight terminals (20-30 pieces of each).

This terminal connector kit also includes a versatile tool that cuts and strips as well as crimps both insulated and non-insulated terminals. All packaged in a deluxe metal box with molded compartments for each individual terminal type.

060X986 4800 Deluxe Terminal Kit1-5, \$99.00 ea.; 6-up, \$89.00 ea.





Thomas & Betts

Sta-Kon® Plier-Type Tools

These application tools are designed for installation of the various Sta-Kon® terminal series. Wire range is #22-10 AWG.

The WT111M Plier with cutters installs "A" and "B" Sta-Kon terminals gauging .027-.053 plus "C" Sta-Kon PT non-insulated terminals and splices gauging .072-.098. It features black and orange plastisol handle grips. The 1-pound tool measures 9¹/₃₂" x 1¹/₄".

Model WT112M Plier with wire cutters installs RC insulated and RA, RB, A, B and C non-insulated nylon and vinyl Sta-Kon terminals, splices, disconnects and wire joints. It features black and orange plastisol handle grips plus crimping nests for both insulated and non-insulated Sta-Kons. The 1-pound tool measures 9¹/₃₂" x 1¹/₄".

The WT2000 is a termination accessory designed for use with crimp connectors. Use this combination plier, cutter, stripper and crimping tool with insulated terminals and splices. Wire sizes are 22-18, 16-14 and 12-10. The 1-pound tool measures 9¹/₃₂" x 1¹/₄".

272X190 WT111M Non-Insulated Plier1-5, \$30.50 ea.; 6-up, \$29.00 ea.

272X193 WT112M Insulated/Non-I Plier...1-5, 29.50 ea.; 6-up, 28.00 ea.

272X195 WT2000 Plier/Cut/Strip/Crimp..1-5, 34.50 ea.; 6-up, 32.50 ea.

Sta-Kon® Ratchet and Crimping Tools

Model WT145C Ratchet Hand Tool provides the correct compression every time. The Shure-Stake® mechanism principle prevents opening of the handles until full staking action of 10 pounds minimum is completed. Use it to install self-insulated and non-insulated Sta-Kon terminal series in the #26-10 AWG wire range. It installs RA, RB and RC, RAA, RBB, RCC and RBC nylon and vinyl terminals, disconnects and splices. The WT2130A Ratchet Hand Tool installs RBC, RC and RD Sta-Kon terminals #14-#8 plus RC6 and RP7 wire joints. The force required to release Shure Stake mechanism is 20 pounds minimum.

New ergonomically designed Comfort Crimp™ Terminal Tools help reduce the risk of Carpal Tunnel Syndrome. Their unique design delivers the same reliable crimp with up to 60% less handle force than other terminal hand tools. The Shure-Stake mechanism helps ensure a complete crimp cycle before it releases the tool. Color-coded die nests on both sides are included for insulated terminals. The ERG-2001 installs RA, RB and RC nylon and vinyl terminals, splices and disconnects 22-10/22-14 AWG. Model ERG-2002 (not pictured) installs A, B and C non-insulated terminals, splices and disconnects 22-10 AWG. The ERG-2007 installs RD and RE insulated terminals. Two-year warranty.

272X197 WT145C Ratchet Hand Tool....1-5, \$332.00 ea.; 6-up, \$316.00 ea.

272X130 WT2130A Ratchet Hand Tool..1-5, 224.00 ea.; 6-up, 213.00 ea.

272X120 ERG-2001 Ratchet Crimper.....1-5, 154.00 ea.; 6-up, 147.00 ea.

272X115 ERG-2002 Non-Instld. Crimper..1-5, 154.00 ea.; 6-up, 147.00 ea.

272X117 ERG-2007 Insulated Crimper..1-5, 201.00 ea.; 6-up, 191.00 ea.



Thomas & Betts

Color-Keyed® Connector Tools

Use the TBM6S Color-Keyed Installing Tool to install 63105 thru 63140 orange, (green) and (blue) "H" taps; #8 thru 500 MCM copper lugs, splices and taps plus #10 through 350 MCM aluminum lugs and splices. It includes Shure-Stake® device, wire brush and steel carrying case.

Dies must be purchased separately. This 21.1-pound tool measures 26" x 4".

Model TBM60RS offers the same features as the TBM6S except this tool is designed with short handles and a ratchet mechanism. Dies must be purchased separately. This 6-pound tool measures 20" x 4".

Order Die Kit separately. Lower and upper dies are also sold individually.

272X310 TBM6S Crimper.....1-5, \$623.00 ea.; 6-up, \$592.00 ea.

272X315 TBM60RS Crimper.....1-5, 593.00 ea.; 6-up, 564.00 ea.

272X308 TBM6D-1 Die Kit.....1-5, 525.00 ea.; 6-up, 499.00 ea.

272X472 13472 Upper Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

272X473 13473 Upper Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

272X474 13474 Upper Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

272X475 13475 Upper Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

272X476 13476 Lower Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

272X477 13477 Lower Die.....1-5, 82.00 ea.; 6-up, 77.00 ea.

Color-Keyed® Connector Tools with Dies

Model TBM25S installs copper lugs and splices from #8 to #2 C taps; from 54705 to 54725, pigtailed from 3#12; aluminum lugs and splices plus #10 to #6. It has a five nested die wheel (color coded) and is equipped with the Shure-Stake® mechanism. This 1.4-pound tool measures 10¹/₄" x 2³/₄".

The TBM5-S installs copper conductors from #8 to 250 MCM lugs, splices joints and taps plus aluminum cables from #10 to 4/0. Shure-Stake® feature ensures positive compression. Includes dies. This 9.4-pound tool measures 26" x 4".

Model TBM8S installs code copper lugs and connectors from #8 to 500 MCM; all code copper compression joints and "C" taps; aluminum lugs and connectors from #10 to 350 MCM plus Blackburn compression lugs and connectors. Comes complete with Shure-Stake® device and color-coded installing dies with die-embossing for easy installation and inspection. Packaged in a steel case. This 20.5-pound tool measures 26" x 4".

T&B Connectors with T&B Tools are UL and CSA approved as a system.

272X300 TBM25S 5 Nested Crimper...1-5, \$154.00 ea.; 6-up, \$147.00 ea.

272X305 TBM5-S Crimper.....1-5, 537.00 ea.; 6-up, 510.00 ea.

272X320 TBM8S Crimper.....1-5, 919.00 ea.; 6-up, 873.00 ea.



Color-Keyed® Self-Contained Hydraulic Crimping Tools

The TBM14M self-contained hydraulic crimping tool installs copper and aluminum Color-Keyed® connectors; copper and aluminum lugs and two-way connectors to 750 MCM; copper C-taps through #54775, aluminum "H" taps through #63150 plus grid connectors through 250 MCM, 5/8" rod. Features rapid-ram advance mechanism for fast installation, field replaceable bypass cartridge and short fiberglass handles for confined work spaces. Develops 14-ton compression force and uses standard T&B 15-ton shell dies (sold separately). Includes carrying case.

Model 297-31858 works the same as the TBM14M except it features an insulated head. T&B Connectors with T&B tools are UL and CSA approved as a system. Each 16.5-pound tool measures 25½" x 4½".

272X325 TBM14M Manual Hyd Tool...1-5, \$1588.00 ea.; 6-up, \$1509.00 ea.

272X100 297-31858 Crimper Hyd Tool...1-5, 1825.00 ea.; 6-up, 1749.00 ea.



Thomas & Betts

Non-Self-Contained Hydraulic Heads

TBM15's new longer, slimmer profile allows easier access into tight spaces like cable tray and central office applications. Wider jaw opening eases crimping of larger lugs, C taps and H taps. Can be used to install copper and aluminum lugs and splices up to 1000 MCM, C and H taps and grid ground connectors. Available with an insulated head and runs off of existing 10,000-psi hydraulic pumps.

Features 15-ton capacity, open yoke C-style head. Crimps connectors through 1000 MCM, C and H taps, grid ground. Uses interchangeable Thomas & Betts 15500 and 15600 series dies and adapters (sold separately). The 15500 Series dies require an optional 15500-TB Adapter for use with the TBM15 tool. Includes steel carrying case. Tool weight is 14 pounds.

The 13100A crimping tool features 14-ton capacity, open yoke C-style head. It installs copper and aluminum color-keyed connectors to 750 MCM, copper C-taps through #54775, aluminum H-taps through #63148 plus grid connectors through 500 MCM 5/8" rod. Uses standard interchangeable T&B 15-ton shell dies (sold separately). Adapter not required. Includes steel carrying case. Tool weighs 10 pounds.

272X330 TBM15 15-Ton Head1-5, \$1588.00 ea.; 6-up, \$1509.00 ea.

272X121 15500-TB 15500 Series Die Adapter for TBM15199.00 ea.

272X095 13100A 14-Ton Head1-5, 1095.00 ea.; 6-up, 1040.00 ea.



Electric Hydraulic Pump

Model 13600 is for use with all the T&B hydraulic heads. It consists of a pump with pressure gauge and a Pioneer-type male coupler with output pressure at 9800 psi. Options include 10-foot non-metallic hose, 20-foot non-metallic hose, hand switch with 10-foot cord and foot switch with 10-foot cord.



272X450 13600 Electric Pump1-5, \$2462.00 ea.; 6-up, \$2339.00 ea.

272X453 13619 10' Non-Metal Hose...1-5, 234.00 ea.; 6-up, 223.00 ea.

272X457 13618 20' Non-Metal Hose...1-5, 306.00 ea.; 6-up, 291.00 ea.

272X462 13620 Hand Switch, 10'.....1-5, 188.00 ea.; 6-up, 179.00 ea.

272X335 13589A Foot Switch, 10'.....1-5, 236.00 ea.; 6-up, 225.00 ea.

TBM14M, TBM15 and 13100A Hydraulic Heads

Stock No.	Part No.	Code No.	Wire Size		Color	Price
			Code	Flex		
272X123	15520*	21	8		Red	\$102.00
272X122	15522*	24	6		Blue	102.00
272X127	15527*	29	4		Gray	102.00
272X128	15528*	33	2		Brown	102.00
272X113	15513*	37	1	2	Green	102.00
272X108	15508*	42H	1/0		Pink	109.00
272X126	15526*	45	2/0	1/0	Black	109.00
272X133	15530*	50	3/0	2/0	Orange	102.00
272X111	15511*	54H	4/0		Purple	109.00
272X110	15510*	62	250 MCM	4/0	Yellow	109.00
272X134	15534*	66	300 MCM		White	102.00
272X114	15514*	71H	350 MCM		Red	109.00
272X112	15512*	76	400 MCM		Blue	102.00
272X118	15517*	80		350		102.00
272X106	15506*	87H	500 MCM		Brown	109.00
272X511	15611	94H	600 MCM		Green	102.00
272X136	15536*					109.00
272X105	15505*	99H	535 MCM	500	Pink	86.00
272X119	15515*	106H	750 MCM		Black	109.00
272X508	15608	107H	800 MCM		Orange	102.00
272X509	15609	112H			Purple	102.00
272X104	15504*	115H	900 MCM	750	Yellow	102.00
272X203	15603	125H	1000 MCM			102.00

* All 15500 Series dies require optional 15500-TB Adapter for use with TBM15 tool.

Battery-Powered Hydraulic Pump

The 13650A Pumpac™ is a battery-powered hydraulic pump that comes with everything you need. Rated for a 10,000-psi hydraulic system, it supplies enough strength to power all the remote hydraulic heads in the T&B tooling line. Because it's easier to use and lighter weight than ac-powered pumps, crimping is smoother and quicker.

T&B's 10-foot hydraulic hose is rated for a 10,000-psi system. The pump features a 24-V dc motor with a reservoir capacity of 38 cubic inches (.62L). Includes 24-V rechargeable dc ni-cad battery pack, 120-V ac battery charger, remote pump switch, shoulder strap for easy carrying and instructions. Replacement accessories also sold separately. Model 13650A weighs 17.5 pounds with battery.

272X441 13650A Hydraulic Pump...1-5, \$2387.00 ea.; 6-up, \$2270.00 ea.

272X444 13650B Battery Pack1-5, 205.00 ea.; 6-up, 195.00 ea.

272X447 13650C Battery Charger...1-5, 288.00 ea.; 6-up, 274.00 ea.



Connector Kits

Our Connector Kits are packaged in plastic compartmentalized storage/carrying cases. The contents are neatly divided into organized sections in the bottom of each case. In the lid you will find a handy chart identifying each connector by size with an illustration. Choose from a variety of six assortments. Always have the correct connector!



Wire Nut Assortment — Use this 130-piece set to connect power conductors easily without twisting, soldering or wrapping with tape. Screw action automatically twists wires together, forming a snug fit. Color-coded high-dielectric plastic shells identify sizes. Includes 40 gray 22-16 AWG, 30 blue 22-14 AWG, 25 orange 22-14 AWG, 25 yellow 18-10 AWG and 10 red 18-10 AWG.

571X895 WN-130 Kit.....1-9, \$16.00 ea.; 10-up, \$13.50 ea.



Insulated Terminal Assortment — These 555 vinyl insulated solderless terminals connect external circuits. Includes eight ring, five spade, two hook and three butt connector types. UL/CSA color coded for wire gauge USA. Rings come 35 each in the following wire gauges, stud sizes: 22-18, 6; 16-14, 6; 16-14, 8; 16-14, 10; 16-14, 1/4; 20 each 12-10, 10; 12-10, 1/4; 12-10, 3/8. You get 35 each spades in the these wire gauges, stud sizes: 22-18, 6; 22-18, 10; 16-14, 6; 16-14, 8; 20 each 12-10, 10. Hooks are 35

each 22-18, 10; 16-14, 10. Butt connectors come

35 each in wire gauges of 22-18, 16-14; 20 each 12-10.

571X555 TI-555 Kit.....1-9, \$47.00 ea.; 10-up, \$40.00 ea.



3M

923000-I Insulated Electrical Terminal Kit For Wire Sizes 12 to 22 AWG

This 3M kit contains an assortment of our most popular Scotchlok® terminals for wire sizes 12 to 22 AWG. The addition of cable ties and wire markers with dispenser make this a truly unique kit. This combination of products, combined with a TH440 Crimping Tool, affords the user all the tools needed to perform wiring tasks.

Kit includes 650 assorted terminals in 14 sizes. Rings come 50 each in the following wire gauges, stud sizes: 22-18, 8; 16-14, 5-6; 16-14, 8; 16-14, 10; and 22-18, 5-6; plus 25 each 12-10, 10. You get 50 each fork terminals in these wire gauges, stud sizes: 16-14, 8; 16-14, 10; 22-18, 8; and 22-18, 6. Also includes 50 .110 width, .020 gap disconnects. Butt splices come 50 each in 22-18 and 16-14 gauges with 25 each in 12-10 gauge. You also get 200 cable ties (100 each in two sizes), wire marker tape dispenser, crimping tool, reusable divided metal storage box and reordering information card.

599X950 923000-I Electrical Terminal Kit.....1-5, \$121.00 ea.; 6-up, \$112.00 ea.

Slotted Round Head Machine

Screw Assortment — This kit contains 280 plated machine screws. You get six sizes with three sizes of hex machine screw nuts. Contains 25 each 6-32 x 1/2", 6-32 x 1", 8-32 x 1/2", 8-32 x 1"; 20 each 10-24 x 3/4", 10-24 x 1 1/2"; 50 each 6-32, 8-32 hex nuts; 40 each 10-24 hex nuts.

571X248 MSR-280 Kit.....1-9, \$24.00 ea.; 10-up, \$20.50 ea.



Fully Insulated Terminal

Assortment — You get 150 fully insulated nylon quick disconnect terminals. They are constructed of tin-plated copper alloy. Full insulation eliminates secondary operation of taping. This improves quality of circuit and reduces installation time. Contains 25 each female and 25 each male terminals color coded to the following wire gauges: 22-18, 16-14 and 12-10. UL listed, CL/CSA approved. Made in the USA.

571X100 AE-1 Kit.....1-9, \$29.00 ea.; 10-up, \$24.50 ea.



Slotted Pan Head Sheet

Metal Screw Assortment — A complete assortment of hard-to-find sheet metal screws. You get 400 plated and self-tapping sheet metal screws in 11 sizes. This kit contains 60 #6 x 1/2", 40 #6 x 3/4", 30 #6 x 1", 50 #8 x 1/2", 20 #8 x 3/4", 20 #8 x 1", 40 #10 x 1/2", 60 #10 x 3/4", 20 #10 x 1", 30 #12 x 1", 30 #14 x 1".

571X400 SMSP-400 Kit.....1-9, \$27.50 ea.; 10-up, \$23.50 ea.



Stripall Thermal Wire Strippers

Designed to aerospace standards for electronic assembly, Stripall combines high production ranges with high wiring reliability.

Remove even the toughest high-temperature insulation with ease, leaving wire free of oxides, nicks or deformations. It's especially valuable with small gauge wire. Each unit has adjustable strip and wire-gauge stops.

Rugged alloy blades have long life under demanding production schedules. They heat to 1700° F in under four seconds, cool instantly and provide complete operator safety. Because of the unique gauge stop adjustable from #12 to #43 AWG, blades don't contact or exert pressure on conductor. This protects remaining insulation against damage since wire is not heated.

A. TW-1 Standard Model: For general production work to aerospace and milspec standards. Self-contained and hand held with adjustable stops.

Model TW-1

605X1001-5, \$180.00 ea.; 6-up, \$169.00 ea.

B. TWC-1 Controlled-Temperature Model: Solid-state temperature control mounts at electrical outlet. Adjustable from 100° F to above 1700° F.

605X150 Model TWC-1.....1-5, \$231.00 ea.; 6-up, \$218.00 ea.

TELEDYNE KINETICS

Weidmüller

Self-Adjusting Wire Strippers

These unique self-adjusting wire strippers give you maximum wire handling convenience and cost efficiency. Each tool is built to withstand the constant wear of assembly production work. The self-adjusting feature means you always have the correct stripper at hand. Choose from two models.

A. 1100 Standard Stripax: Cuts and strips 12- to 24-AWG single- or multi-conductor wire. It even strips up to six conductors simultaneously.

170X020 1100 Wire Stripper.....1-11, \$70.50 ea.; 12-up, \$64.00 ea.

170X250 2101 Repl. Blades Only.....27.50 ea.

B. 1115P Mini-Stripax: Cuts and strips 16- to 30-AWG solid or stranded wire. It is a very useful tool for stripping smaller gauge wires.

170X025 1115P Wire Stripper1-11, \$70.50 ea.; 12-up, \$64.00 ea.

170X274 2108 Repl. Blades Only.....20.00 ea.

Custom Stripmaster

Precisely strip 10- to 30-AWG solid and stranded wire to military specifications without nicking or scraping wire and minimal marking of insulation. Exclusive die-type blade design incorporates counterbored hole sized to insulation and inner cutting hole sized to conductor. Counterbored hole acts as collet, compressing insulation slightly to center conductor and preventing blade cutting surface from contacting conductor surface. Each hole on blade is identified with AWG size. Cutting hole and counterbored dimensions can be different per AWG size depending on wire construction and insulation thickness. Simple one-squeeze operation. Insert wire between blades to desired length, squeeze and release.

Stock No.	Part No.	Wire Gauge	Prices	
For General-Purpose Stripping			1-5	6-up
370X241	45-170	10-14	\$114.00	\$107.00
370X242	45-171	16-26	114.00	107.00

For MIL-W-16878 Type E 600V. Teflon® Wire

370X247	45-176	10-14	\$114.00	\$107.00
370X248	45-177	16-26	114.00	107.00

For MIL-W-16878 Type EE 1000V. Teflon® Wire

370X244	45-173	10-14	\$114.00	\$107.00
370X245	45-174	16-26	114.00	107.00

Stripmaster

Industry standard automatic hand stripper has knife-type blades for general-purpose stripping of 8-30 AWG wire. A light squeeze strips wire clean up to 7/8". Holds jaws open to remove wire without crushing end. Practically eliminates nicking, cutting or fraying. Strip lighter gauge, automotive, PVC hook-up, telephone and fixture wire plus radio and instrument wire and cable.

Stock No.	Part No.	Wire Gauge	Prices	
			1-9	10-up
370X186	45-091	10-18	\$25.00	\$23.50
370X187	45-092	10-22	25.00	23.50
370X188	45-093	14-22	25.00	23.50
370X192	45-097	16-26	25.00	23.50
370X193	45-098	20-30	25.00	23.50

T-Strippers

Ideal's T-Strippers provide fast, low-cost tool-up for commercial-grade wire stripping. Clean, smooth action and comfortable grips make them easy to work with hour after hour. Four models strip 8-30 gauge, single or stranded wire. One model cuts copper or aluminum wire up to 10 AWG. Overall size is about 6".

Stock No.	Part No.	Description	Prices	
			1-9	10-up
370X211	45-121	16-26 AWG, Stranded	\$9.75	\$9.25
370X215	45-125	22-30 AWG, Single	9.75	9.25
370X214	45-124	8-16 AWG, Stranded	9.75	9.25
370X210	45-120	10-18 AWG, Single	8.50	8.00
370X213	45-123	Wire Cutter	9.75	9.25

Adjustable Wire Strippers

These wire strippers and cutters are suitable for all commonly used insulated wires. All cutting surfaces are ground to ensure smooth shearing action. Adjusting stop on gripping handles permits adjustment for wire sizes.

A. Model 100: Standard adjustable model for general-purpose stripping.

155X100 Model 100.....1-11, \$3.40 ea.; 12-up, \$3.10 ea.

B. Model 101-S: Standard adjustable wire stripper with spring.

155X101 Model 101-S.....1-11, \$4.15 ea.; 12-up, \$3.75 ea.

C. Model 103-S: Standard stripper with spring and adjustable wire stop.

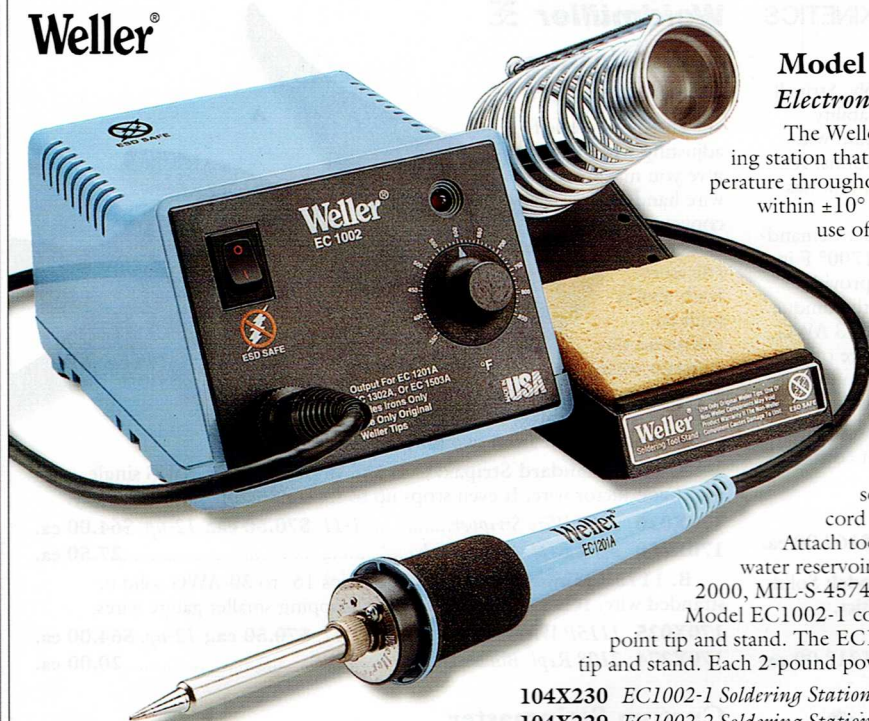
155X103 Model 103-S.....1-11, \$5.25 ea.; 12-up, \$4.75 ea.

D. Model 69: Star dial sets proper size to avoid damaging wires. Spring opening jaws lock in closed position to protect cutting edges.

046X069 Model 69.....1-11, \$8.40 ea.; 12-up, \$7.60 ea.



Weller®



Model EC1002-1

Electronic Temperature Controlled Soldering Station

The Weller EC1002-1 is an electronically controlled temperature soldering station that provides greater safety for sensitive components. Adjust tip temperature throughout 350° F to 850° F range with control knob calibrated to within $\pm 10^\circ$ F. Dynamic response to soldering load variation is ensured by use of a rapid response platinum sensor and full proportional heater control. The electronic system utilizes thyristor power control with zero voltage thyristor drive to ensure that no high voltage spikes will be present on the soldering tool tip. Heating pulses are indicated by LED pilot lamp, and laser trimmed hybrid circuits give reliability, stability and precision over entire temperature set range.

A True-Blue, ESD-safe housing encases the power unit including transformer, on-off switch with indicator light and calibrated temperature-adjustment knob. The tool contains soldering tip, stainless steel heating element, platinum sensor, heat-insulated handle, 4-foot black ESD-safe burn-proof cord and locking male plug that mates with receptacle on power unit.

Attach tool holder to either side of transformer case or use it separately. A water reservoir with wick keeps tip wiping sponge moist. Meets DOD-STD-2000, MIL-S-45743, W-S-6536 and W-S-570 military specifications.

Model EC1002-1 comes with 40-watt EC1201A soldering iron, ETA screwdriver point tip and stand. The EC1002-2 includes 20-watt EC1302A soldering iron with EPH101 tip and stand. Each 2-pound power unit measures 6.25" x 4.75" x 3.75". One-year warranty.

104X230	EC1002-1 Soldering Station.....	1-3, \$232.00 ea.; 4-up, \$214.00 ea.
104X229	EC1002-2 Soldering Station.....	1-3, 232.00 ea.; 4-up, 214.00 ea.

Replacement Parts for EC1002-1 and EC2002M2

Weller EC1002-1 and EC2002M2 Soldering Stations have become industry standards for quality and reliability. Because of their modular design, when a part does fail after extensive use, it can be repaired easily on site even by non-technical personnel, virtually eliminating downtime. Choose from the most commonly used parts.

Stock No.	Part No.	Description	Price
104X250	EC1201A	Soldering Tool w/ ETA Tip	\$90.00 ea.
104X779	TC-205	Sponge	2.00 ea.
104X231	EC234	Heater Element for Soldering Tool	13.50 ea.
104X050	BA-60	Barrel Nut Assembly	5.50 ea.

Model EC2002M2

Micro Digital, Static-Safe Soldering Station

- For microelectronic applications
- Housed in ESD-safe case
- LED display with instantaneous readings
- Fully complies with military standards

Weller's Model EC2002M2 is specifically designed for working in microelectronic environments. It has an infinitely variable temperature range of 350° F to 850° F (calibrated to $\pm 1^\circ$ F). Both the tool handle and station housing are free from stored static charges. An LED readout displays temperature settings and tip temperature with a resolution and stability of 1° F. Instantaneous tip temperature readings are achieved with the switch in the read position.

Model EC2002M2 comes in a True-Blue ESD-safe case. The exterior housing of the power unit and the iron are made of a special conductive plastic and grounded with a separate flexible conductor that terminates at the third pin on the power cord. Both the unit and special materials used pass UL safety tests and are fully UL approved.

The stand provides tip storage and can be positioned to the left, right or remote from the main unit. A water reservoir keeps the sponge moist. Complies with Military Standards DOD-STD-2000, Mil-S-2000, Mil-S-45743, W-S-6536, W-S-570 and DOD-STD-1686.

Model EC2002M2 comes with 20-watt EC1302A soldering iron, EPH101 tip, stand and operations guide. The EC2002M1 includes 40-watt EC1201A soldering iron with ETA tip, stand and operations guide. Additional tips available separately for varying applications. Each 2-pound power unit is 6.25" x 4.75" x 3.75". One-year warranty.

104X285	EC2002M2 Solder Station ...1-5, \$318.00 ea.; 6-up, \$293.00 ea.
104X260	EC2002M1 Solder Station ...1-5, 318.00 ea.; 6-up, 293.00 ea.



104X255	EC1302A Rpl. ESD Micro-Iron Only.....	\$90.00 ea.
104X320	EPH-101 Rpl. Tip (1/64" Micropoint).....	5.25 ea.
104X321	EPH-102 Rpl. Tip (1/32" Bent Conical).....	5.25 ea.
104X326	EPH-106 Rpl. Tip (1/16" Screwdriver).....	5.25 ea.
104X325	EPH-105 Rpl. Tip (3/64" Single Flat).....	5.25 ea.



Model WTCPT

Controlled-Output Soldering Station

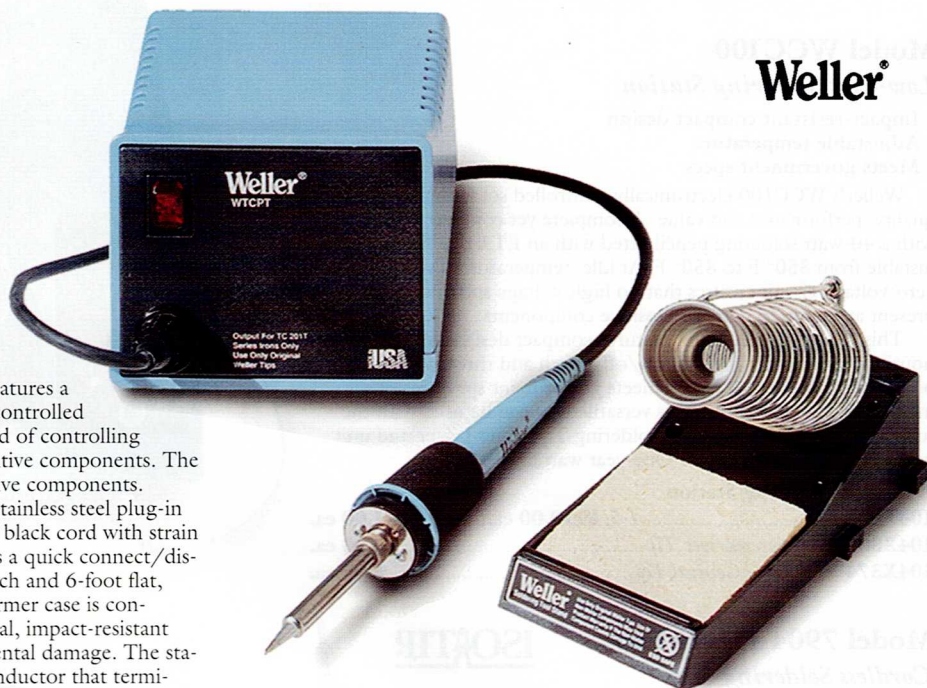
- Popular, versatile and safe to use
- Guarantees constant, reliable, controlled tip temperature
- True-Blue transformer case constructed of ESD-safe materials
- Additional PT Series soldering tips available

The industry's most popular soldering station is the 24-volt output Weller WTCPT. With literally hundreds of thousands in use, it incorporates the patented Magnastat system that guarantees a constant and reliable tip temperature at all times (600, 700 or 800° F). This transformer-powered soldering station features a lightweight, heat-insulated, low-voltage, temperature-controlled soldering pencil. It utilizes a special closed-loop method of controlling maximum tip temperature to protect temperature-sensitive components. The grounded tip protects both voltage- and current-sensitive components.

Model TC201T 42-watt Soldering Pencil features stainless steel plug-in heating element construction. It has a 4-foot ESD-safe black cord with strain relief to extend cord life. This soldering station features a quick connect/disconnect plug for the soldering iron, lighted off-on switch and 6-foot flat, flexible, three-wire power cord. The True-Blue transformer case is constructed of ESD-safe materials (not to Mil-Spec). Special, impact-resistant plastic provides durability and protection against accidental damage. The station housing and iron are grounded with a separate conductor that terminates at the third pin on the power cord.

The soldering iron stand can be attached to either side of the transformer case or remain separate. It incorporates a water reservoir with wick to keep the tip wiping sponge moist and a storage tray for extra tip storage. This UL-listed soldering station comes with a PTA7 1/16" screwdriver with 700° F tip. Additional PT Series Soldering Tips are available separately. They come in a variety of shapes and sizes in three temperature ranges (600, 700 and 800° F). The 2-pound power unit is 6.25" x 4.75" x 3.75". One-year warranty.

104X955 WTCPT Soldering Station.....1-5, \$132.00 ea.; 6-up, \$119.00 ea.

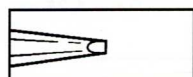


Weller®

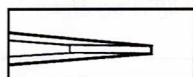
Replacement Parts for WTCPT

Stock No.	Part No.	Description	Price
104X773	TC-201T	Soldering Pencil with PTA7 Tip	\$73.00 ea.
104X779	TC-205	Sponge	2.00 ea.
104X231	EC234	Heater Element for Soldering Pencil	13.50 ea.
104X050	BA-60	Barrel Nut Assembly	5.50 ea.

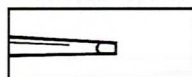
Genuine Weller® Replacement Soldering Tips



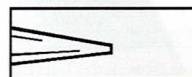
Screwdriver



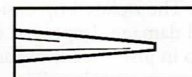
Long Screwdriver



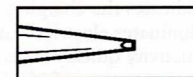
Narrow Screwdriver



Conical



Long Conical



Conical Flat

Tips for WTCPT Soldering Station

Model WTCPT Soldering Station utilizes PT Series tips that are available in a wide range of sizes and shapes. Also select from three different temperature choices. These tips are solid copper plated with iron, nickel and chromium.

Tip No.	Size	Description	600° F	700° F	800° F
PTA	1/16"	Screwdriver	104X540	104X541	104X542
PTB	3/32"	Screwdriver	104X552	104X553	104X554
PTC	1/8"	Screwdriver	104X564	104X565	104X566
PTD	3/16"	Screwdriver	104X575	104X576	104X577
PTF	1/32"	Conical Flat	104X595	104X596	104X597

All Tips: 1-9, \$5.25 ea.; 10-49, \$4.75 ea.; 50-up, \$4.25 ea.

Tip No.	Size	Description	600° F	700° F	800° F
PTK	3/64"	Long Screwdriver	104X605	104X606	104X607
PTO	1/32"	Long Conical	104X617	104X618	104X619
PTP	1/32"	Conical	104X620	104X621	104X622
PTR	1/16"	Narrow Screwdriver	104X626	104X627	104X628
PTS	1/64"	Long Conical	104X630	104X631	104X632

All Tips: 1-9, \$5.25 ea.; 10-49, \$4.75 ea.; 50-up, \$4.25 ea.

Tips for WCC 100, EC1002-1 and EC2002M1 Soldering Stations

The EC1002-1 and EC2002M1 Soldering Stations use the same ET Series tips that are available in a wide range of sizes and shapes. These tips are solid copper plated with iron, nickel and chromium.

Stock No.	Part No.	Description	1-9	10-49	50-up
104X350	ETA	Tip 1/16" Screwdriver	\$5.00	\$4.50	\$4.00
104X352	ETB	Tip 3/32" Screwdriver	5.00	4.50	4.00
104X354	ETC	Tip 1/8" Screwdriver	5.00	4.50	4.00
104X356	ETD	Tip 3/16" Screwdriver	5.00	4.50	4.00
104X362	ETH	Tip 1/32" Screwdriver	5.00	4.50	4.00

Stock No.	Part No.	Description	1-9	10-49	50-up
104X366	ETK	Tip 3/64" Long Screwdriver	\$5.00	\$4.50	\$4.00
104X368	ETL	Tip 5/64" Long Screwdriver	5.00	4.50	4.00
104X374	ETO	Tip 1/32" Long Conical	5.00	4.50	4.00
104X376	ETP	Tip 1/32" Conical	5.00	4.50	4.00
104X382	ETS	Tip 1/64" Conical	5.00	4.50	4.00

Tips for EC2002M2 Soldering Station

Model EC2002M2 Soldering Station utilizes the EPH Series tips that are available in a wide variety of sizes and shapes. These tips are solid copper plated with iron, nickel and chromium.

Stock No.	Part No.	Description	1-9	10-49	50-up
104X320	EPH-101	Rpl. Tip 1/64" Micropoint	\$5.25	\$4.75	\$4.25
104X321	EPH-102	Rpl. Tip 1/32" Bent Conical	5.25	4.75	4.25
104X326	EPH-106	Rpl. Tip 1/16" Screwdriver	5.25	4.75	4.25
104X325	EPH-105	Rpl. Tip 1/64" Single Flat	5.25	4.75	4.25



Model WCC100

Low-Cost Soldering Station

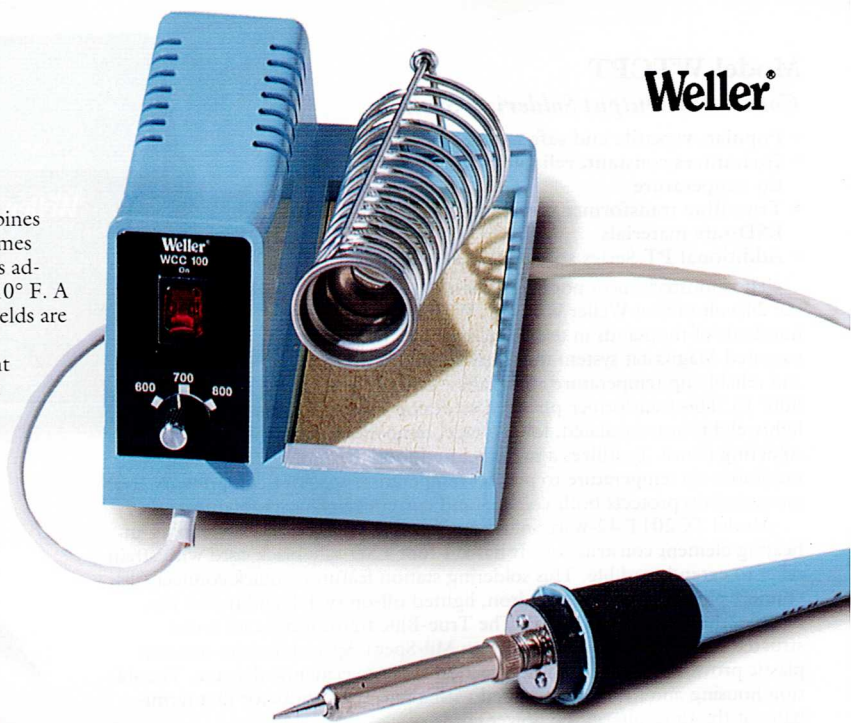
- Impact-resistant compact design
- Adjustable temperature
- Meets government specs

Weller's WCC100 electronically-controlled soldering station combines quality, performance and value. A complete yet compact system, it comes with a 40-watt soldering pencil fitted with an ETA tip. Temperature is adjustable from 350° F to 850° F. At idle, temperature is stable within 10° F. A zero-voltage circuit ensures that no high-voltage spikes or magnetic fields are present at the tip to damage sensitive components.

This UL-recognized unit features compact design, impact-resistant housing, iron handle, lighted on/off switch and three-wire grounded power cord. Model WCC100 meets government specifications including Mil STD 2000. This versatile tool can be used with the full range of Weller ET Series Soldering Tips. The 1.4-pound unit measures 4.5" x 3.75" x 6". One-year warranty.

WCC100 Soldering Station

104X820	1-5, \$110.00 ea.; 6-up, \$101.00 ea.
104X350 1/16" Screwdriver Tip	5.00 ea.
104X374 1/32" Long Conical Tip	5.00 ea.



Weller®

Model 7904 Power Pro

Cordless Soldering Iron

- 200 solder joint capacity
- 5-second warm-up time
- 900° F tip temperature

High-capacity cordless iron provides convenience and efficiency. It solders longer without recharging and requires less power to heat up. Power Pro's higher capacity battery combined with advanced higher efficiency tips provides up to 30 minutes of continuous soldering time from a fully charged iron or over 200 solder joints intermittently.

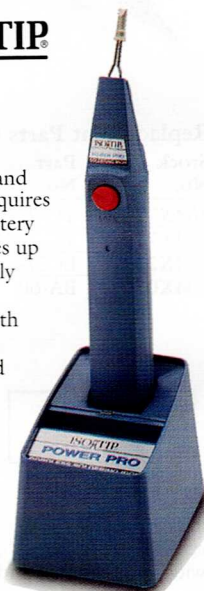
The 7904 features lightweight, balanced design with easily replaceable battery and worklight. It completely recharges in four hours. An LED in the recharge stand indicates the charging status. The isolated tip design eliminates electrical leaks and damage. Improved conductivity quickly heats the tip in just 5 seconds for performance to 900° F. It features excellent heat transfer and recovery.

Includes soldering iron, charging stand, high-efficiency 7545-100 fine tip and 7577-100 chisel tip for improved performance. The Power Pro unit weighs 1 pound. One-year warranty.

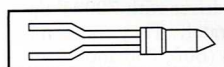
7904 Power Pro Cordless Soldering Iron

102X850	1-5, \$54.00 ea.; 6-up, \$49.50 ea.
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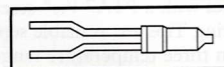
ISOATIP®



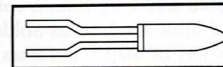
Soldering Tips



High-Efficiency Regular Tip

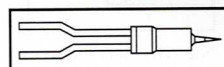


High-Efficiency Fine Tip

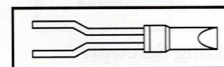


High-Efficiency Heavy-Duty Tip

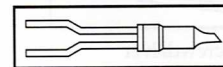
102X301	7535-100 5/32" High-Efficiency Regular Tip	\$4.25 ea.
102X311	7545-100 1/16" High-Efficiency Fine Tip	4.25 ea.
102X321	7546-100 3/16" High-Efficiency Heavy-Duty High-W Tip	4.25 ea.



High-Efficiency Micro Tip



High-Efficiency Chisel Tip



High-Efficiency Beveled Tip

102X371	7566-100 1/4" High-Efficiency Micro Tip	\$4.25 ea.
102X378	7577-100 5/16" High-Efficiency Chisel Tip	4.25 ea.
102X381	7579-100 3/8" High-Efficiency Bevel Tip	4.25 ea.

SOLMAX 7485

Temperature-Controlled Soldering Station with Fume Extractor

- Fume removal increases productivity and improves work environment
- Convenient, space-saving, economical and efficient method

This is a convenient, space-saving method of removing noxious flux and lead smoke and fumes from the work environment. Designed for the factory floor, R&D or hobbyist, SOLMAX 7485 provides an economical, efficient method to improve the workplace by reducing the chances of headaches, nausea and eye irritations often associated with exposure to solder fumes.

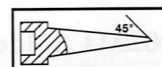
The three-wire grounded soldering iron features continuously adjustable electronic temperature control, highly insulated ceramic heater, zero-voltage spike-free switching, fast heat up and instant heat recovery. The fume extractor features easy-to-replace activated carbon filter, built-in high-efficiency low-noise brushless mini fan and fully grounded design with anti-static plug. The 3-pound fume extractor is 6.4" x 7.8" x 4.8". One-year warranty.

SOLMAX 7485 Soldering Station/Fume Extractor

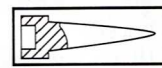
102X036	1-5, \$183.00 ea.; 6-up, \$166.00 ea.
102X906	97906 Replacement Filters (3/pak) 11.75 ea.
102X901	97901 1/32" Tip 5.25 ea.
102X902	97902 1/32" Tip 5.25 ea.
102X903	97903 1/64" Tip 5.25 ea.
102X904	97904 1/16" Standard Tip 5.25 ea.
102X905	97905 1/8" Tip 5.25 ea.

WAHL®

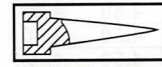
Interchangeable Soldering Tips



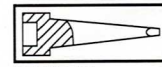
97901 Tip



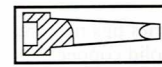
97902 Tip



97903 Tip



97904 Tip



97905 Tip



10225 Proseal™

Environmental Splice Kit

- Proseal butt splices in three sizes
- Ratcheting crimp tool
- UT-100Si Self-Igniting Ultratorch Heat Tool

The Proseal Environmental Splice Kit from Master Appliance is ideal for field repairs of automotive, marine, telecommunications and heavy equipment. Packed in a handy red plastic carrying/storage case, Proseal environmental butt splices provide a permanent splice that is resistant to water, condensation, salt corrosion and other contaminants.

Model 10225 includes Proseal Butt Splices in three sizes. You get 15 22-18 gauge (red), 25 16-14 gauge (blue) and 10 10-12 gauge (yellow). Use the included ratcheting crimp tool to crimp splices on each side. Then use the portable UT-100Si Self-Igniting Ultratorch Heat Tool (see complete description above). This butane-powered heat tool is non-electric and can be used as a soldering iron and/or flameless heat tool with variable temperature control. Apply heat from center to outside of sleeve, ensuring epoxy flows out of each end. The 3-pound kit measures 12.25" x 1.75" x 8.13". Ultratorch manual and kit instructions included. One-year warranty.

066X150 10225 Proseal Splice Kit.....1-11, \$185.00 ea.; 12-up, \$170.00 ea.



Ultratorch® UT-100Si

Self-Igniting Heat Tool

- Portable butane-powered tool
- Soldering, heat tip and heat shrink applications

This self-igniting heat tool provides convenient portability for field maintenance and repairs. Its unlimited uses include automotive repairs, soft soldering copper tubing and pipes, soldering circuit boards and welding plastics.

The UT-100Si comes complete with ejector for soldering, shrink attachment, spanner wrench, open-end wrench, soldering tip, heat tip and protective cap. The heat tip comes in handy for electrical applications and reaches 1202° F. NOTE: The UT-100Si operates only as a soldering iron and heat tool; it does not have a torch mode. This butane-powered tool measures 10.3 inches long with soldering tip and weighs 5.5 ounces when filled with gas.

Two optional soldering tips are recommended for field service repair of SMTs. These tips are ideal for consumer electronics, office equipment and telecommunication equipment repair. The Heat Tip has a 2.5-mm outside diameter and a 1.59-mm inside diameter. The Tapered-Needle Soldering Tip is 0.5 mm in diameter. All soldering tips, heat tips and attachments are interchangeable between standard UT-100 and self-igniting UT-100Si. One-year warranty.

UT-100Si Self-Igniting Heat Tool

066X9051-11, \$103.00 ea.; 12-up, \$95.00 ea.

066X147 70-01-50 Heat Tip (1.59-mm I.D.).....16.50 ea.

066X140 70-01-05 Tapered-Needle Tip (0.5 mm).....14.00 ea.



Ultratorch® UT-100

Compact, High-Performance Heat Tool Kit

- Portable, versatile butane-powered torch
- Soldering, heat tip, heat shrink and torch applications
- Tool and accessories packaged in carrying case

Model UT-100 is a compact yet high-performance heat tool. This standard Master® Ultratorch® is highly portable for field maintenance and repair work. Its many uses include aviation, maintaining switch panels, shrink tubing plus terminating heat-shrinkable environmental splices and insulated solder preforms.

Versatile UT-100 comes complete with an ejector for soldering and heat tip applications. A second ejector is provided for torch applications. Soft soldering in the torch mode provides up to 2372° F. The UT-100 also includes heat shrink attachment, tool holder, solder sponge, spanner wrench, soldering tip and heat tip. Use the heat tip for electrical applications.

The butane-powered Ultratorch UT-100 is 9.5" long with soldering tip and weighs 3.7 ounces when filled with gas. This tool and all its accessories come packaged in a metal carrying case which measures 11" x 2" x 2" and weighing 1 pound with contents. All soldering tips, heat tips and attachments are interchangeable between the standard UT-100 and the self-igniting UT-100Si. One-year warranty.

066X900 UT-100 Heat Tool Kit.....1-11, \$109.00 ea.; 12-up, \$100.00 ea.



Model MT-10

Butane-Powered Microtorch

- Compact palm size
- Self igniting with adjustable flame
- 20-minute run time on refillable fuel tank

The MT-10 Microtorch is a compact palm-sized unit powered by a refillable fuel cell. The long razor-sharp blue flame (2500° F/1300° C) is perfect for hundreds of instant portable heat applications. Users include field service technicians, lab technicians, mechanics, professionals, repair personnel and hobbyists in such markets as automotive, electrical/electronic, general industrial, hobby, laboratory, plumbing and repair.

It features a wind-resistant flame and a waterproof self-ignition system with dead man's switch. Flame can be adjusted by a regulator on the front of the fuel cell. A safety lock ensures the switch is not turned on when not in use. MT-10 runs 20 minutes on a full charge. Its compact size makes it perfect for tool kits, field service kits and first-aid survival kits. Uses Master Ultratane butane. Measures 4.33" x 2.56" x 2.5" and weighs 60 g. One-year warranty.

066X770 MT-10 Microtorch1-11, \$26.00 ea.; 12-up, \$24.00 ea.

066X860 Refillable RC-30 Fuel Cell.....4.00 ea.



Model MT-50

Butane-Powered Microtorch

- High output for hand-held or tabletop use
- Self igniting with adjustable flame
- Two-hour run time on built-in fuel tank

Incorporating an internal butane reservoir, the MT-50 Microtorch is perfect for hand-held or hands-free tabletop applications. It generates a long razor-sharp blue flame (2500° F/1300° C). Technicians, mechanics, professionals, repair personnel and hobbyists use it for automotive, electrical/electronic, general industrial, hobby, laboratory, plumbing and repair instant portable heat applications.

It features a built-in self-ignition system with an easy-to-adjust flame. Adjust it by turning the air control sleeve forward or backward to produce a broad or pinpoint flame. It has a two-hour run time on a single tank and is perfect for applications which require continuous heat. High output means you can solder copper tubing, larger battery lugs and heavy-gauge wire. Runs on Master Ultratane butane. MT-50 measures 1.37" x 6.1" x 2.95" and weighs 5 ounces. One-year warranty.

066X775 MT-50 Microtorch.....1-11, \$44.50 ea.; 12-up, \$41.00 ea.

066X155 10448 Ultratane Refill.....3.00 ea.



Cordless, Butane-Powered Soldering Iron

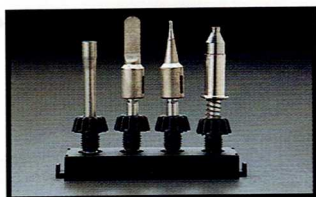
The Portasol® soldering tool provides a completely portable, safe and economical answer to today's soldering and desoldering jobs. This unique micro-precision, *antistatic* soldering tool is ergonomically designed. It provides up to 90 minutes of continuous use. Compact, lightweight Portasol comes with a built-in igniter and heats in less than 30 seconds. The adjustable temperature control regulates the equivalent of 10-60 watts of power, heating a soldering tip to 850° F.

Thanks to its space-age plastic cap that features a safety cut-off switch when replaced, once you're finished, you just close it up and go. It refills in less than 20 seconds with ordinary butane lighter fuel (not included). Portasol also eliminates all risk of leakage current, making it ideal for soldering or desoldering sensitive circuits. Because it's static free, it's perfect for use with CMOS and other static-sensitive devices. The P-1-B soldering tool is only 7 inches long and weighs less than 3 ounces. Includes $\frac{3}{32}$ " (2.4-mm) tip and two-year warranty.

Order the P-1-K-B kit and get the P-1-B Soldering Tool with the 2.4-mm tip plus safety stand, cleaning sponge and three heat tool accessory tips in a rugged plastic storage case. Screw-in tips are easily interchanged. Convert the Portasol into a blow torch, hot blower or hot knife simply by installing a different tip. Now you can have four tools in one!

The optional TB-10 kit contains the four most popular Portasol tips in a compact, protective case that fits in any toolbox. Use the T-5 Blow Torch for light brazing and silver soldering. The T-6 Hot Blower produces a focused, flameless heat for shrink tubing and plastics welding. A T-1 1.0-mm ($\frac{1}{32}$ ") Fine Point Soldering Tip is perfect for soldering jobs requiring pinpoint accuracy. The T-7 Hot Knife is just the tool for cutting and cauterizing synthetic rope and plastics. The TB-10 set is a real bargain, costing less than the four tips would if purchased separately. If you don't need the whole set, individual tips and accessories may also be purchased separately.

720X150 P-1-B Soldering Tool.....1-11, \$29.00 ea.; 12-up, \$27.00 ea.
720X175 P-1-K-B Soldering Tool Kit ...1-11, 53.00 ea.; 12-up, 49.00 ea.



Optional Tips and Accessories

Stock No.	Part No.	Description	Price
720X400	TB-10	Tip and Accessories Set	\$34.00 ea.
720X300	T-1	$\frac{1}{32}$ " (1.0 mm) Replacement Tip	8.50 ea.
720X305	T-2	$\frac{3}{32}$ " (2.4 mm) Replacement Tip	8.50 ea.
720X307	T-3	$\frac{1}{8}$ " (3.2 mm) Replacement Tip	8.50 ea.
720X310	T-4	$\frac{3}{16}$ " (4.8 mm) Replacement Tip	8.50 ea.
720X312	T-5	Blow Torch Replacement Tip	8.50 ea.
720X314	T-6	Hot Blower Replacement Tip	8.50 ea.
720X320	T-7	Hot Knife Tip Accessory	8.50 ea.
720X100		Butane Refill Canister*	4.00 ea.

*Butane refill canister shipped by surface freight only



Professional Soldering Irons

Top-quality, industrial-grade tools develop 750° F temperature. Features include rugged stainless steel barrel construction and long-life, double-coated tips. High-efficiency Weller Soldering Irons have popular pencil styling with light blue handle. Choose from three models. Standard input is 110 volts. The WP25D has 220- to 240-volt input.

Stock No.	Part No.	Description	Tip	Price ea.	
				1-5	6-up
104X900	WP25	25-W Two-Wire Cord	ST, 1/16"	\$31.00	\$28.50
104X903	WP25D	25-W Two-Wire Cord	ST, 1/16"	35.50	32.00
104X910	WP35	35-W Three-Wire Cord	Screwdriver	39.00	36.00

Soldering Stand for WP25, WP35 and W60 Irons

Soldering tool stand includes base, sponge and receptacle. Use it with W60, WP25, WP35 and irons with barrel diameters up to $\frac{19}{32}$ ".

104X525 PH-60 Soldering Stand1-5, \$18.25 ea.; 6-up, \$17.00 ea.

Soldering Tool Stand for W100 Irons

Same as PH-60 but for W100 and irons with barrel diameters up to $\frac{19}{32}$ ".

104X530 PH-100 Soldering Stand1-5, \$20.75 ea.; 6-up, \$19.25 ea.



Controlled Output Soldering Irons

These high-quality portable Weller tools are designed for production work. They provide all the benefits of controlled output and temperature selection (600° F, 700° F or 800° F) by merely changing tips. Handles are light blue in color. Specifications include 120 volts and 50/60 Hz. Choose from four models. Add a Weller PH Series Soldering Tool Stand to turn any of these irons into a complete soldering station.

Stock No.	Part No.	Description	Tip	Price ea.	
				1-5	6-up
104X799	W60P	60-W Two-Wire Cord	700° F, 1/16" Screwdriver	\$59.00	\$54.50
104X800	W60P-3	60-W Round Three-Wire Cord	CT5A7	\$64.00	\$59.00
104X809	W100PG2W	100-W Two-Wire Cord	700° F, 3/8" Screwdriver	\$58.00	\$53.50
104X810	W100P-3	100-W Round Three-Wire Cord	CT6F7	\$69.00	\$63.50

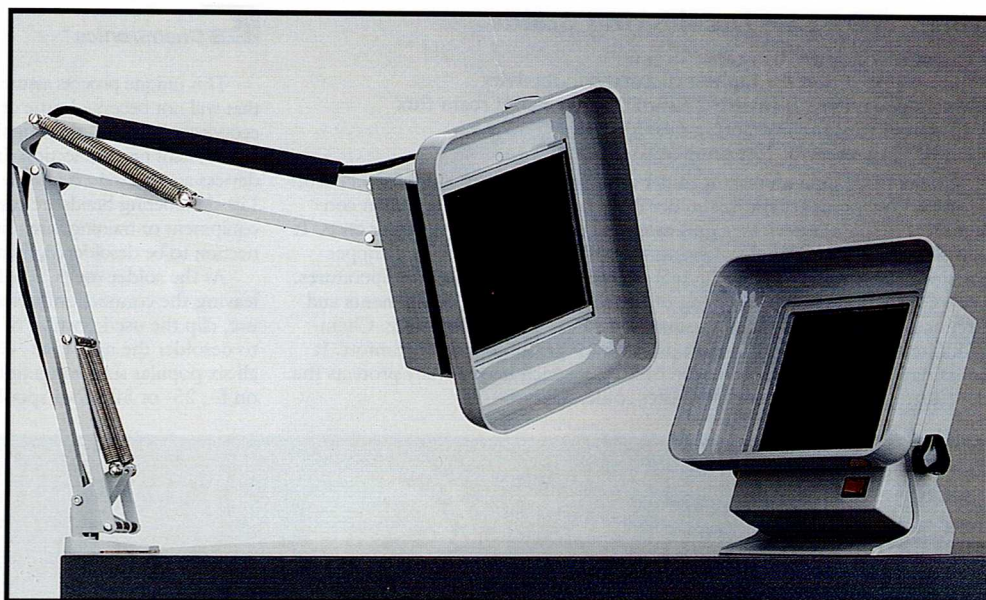


Fume/Smoke Adsorbers

Most soldering operations use flux composed of rosin mixed with halogens. During soldering, the main rosin component generates smoke containing noxious fumes. When they are inhaled, these fumes may cause headaches, nausea, eye disease and occupational asthma.

OK Industries Fume Adsorbers offer production operators and service technicians superior protection from noxious fumes. The aerodynamic hood design effectively draws irritating fumes away from work area. Carbon-impregnated filters are designed to trap up to 80% of fumes associated with soldering and other chemicals. Exceptionally high air intake of 105-126 CFM creates a healthier, safer working environment.

Each compact, low profile unit has an adjustable stand for convenient placement 6" to 8" from work area. Choose from two models powered by standard 115 V ac. One-year warranty.



Models SA-9-115 and SA-9-E-115

Clamp-Type Benchtop Systems

Each compact benchtop model comes complete with adjustable stand and removable hood. Choose from standard Model SA-9-115 or fully conductive Model SA-9-E-115 with static-dissipative housing that meets ESD requirements. Three carbon-impregnated filters are included. Each model weighs 2.25 pounds.

122X655 SA-9-115 Standard Model.....1-5, \$101.00 ea.; 6-up, \$93.00 ea.

122X656 SA-9-E-115 ESD-Safe.....1-5, 129.00 ea.; 6-up, 116.00 ea.

Carbon-Impregnated Replacement Filter Set (for all models)

122X666 SAF-1 Replacement Filters (3/pkg.)\$19.00 pkg.

Model SA-91

Bench-Mounted System with Articulating Arm

The bench-mounted model is designed for work stations with minimum bench space. Articulating arm and detachable head adjust easily to accommodate all work situations. Includes bench-mounting bracket and two spare filters.

122X658 SA-91 Bench-Mount Model..1-5, \$214.00 ea.; 6-up, \$193.00 ea.

Welding

Five-Core Wire Solder

Five-Core Construction: Five separate cores of flux. Only an ultra-thin wall of solder separates flux and work for instant wetting, using less solder. The five-core also eliminates flux voids found in single-cored solders and provides closer controlled ratios of flux to solder.

Ersin Rosin Flux: Extra active, non-corrosive, non-hygroscopic and non-conductive. Vigorous fluxing action, yet you need not remove residue after soldering. Non-toxic in use and free of objectionable odors.

Purity of Metals: All alloys are highest purity, carefully formulated and independently assayed.



Type RA-Activated Rosin Flux Cored

Type	Alloy (Sn/Pb)	Spool Size	Wire Diameter	Wire Gauge	Stock No.	Prices	
						1-9	10-19
SN60	60/40	1 lb.	.063"	16	072X016	\$9.00	\$8.20
SN60	60/40	1 lb.	.050"	18	072X018	9.25	8.30
SN60	60/40	1 lb.	.036"	20	072X020	9.75	8.75
SN60	60/40	1 lb.	.028"	22	072X022	10.75	9.75
SN60	60/40	1 lb.	.022"	24	072X024	13.50	12.00
SN60	60/40	½ lb.	.015"	28	072X027	11.00	9.90
SN63	63/37	1 lb.	.050"	18	072X318	9.50	8.60
SN63	63/37	1 lb.	.036"	20	072X320	10.00	9.00
SN63	63/37	1 lb.	.028"	22	072X322	11.00	10.00
SN63	63/37	1 lb.	.015"	28	072X334	11.00	9.90

KESTER

"44" Activated Rosin Flux Solder

The excellent wetting action of "44" Rosin is a most outstanding property. Even more important and more significant is the fact that the flux is completely non-corrosive and electrically non-conductive.

Throughout its long years of wide usage in the electric and electronic industries involving billions of soldered connections, there has never been a known case of corrosion by the flux residue. Kester "44" Rosin Core is on the qualified products list under specification QQ-S-571, Type WRAP.



Flux-Core Solder — 1-Pound Spools

Type	Alloy (Sn/Pb)	Wire Diameter	Stock No.	Prices	
				1-9	10-19
SN60	60/40	.015	058X250	\$31.00	\$25.50
SN60	60/40	.020	058X254	19.00	13.50
SN60	60/40	.031	058X264	9.50	8.50
SN60	60/40	.050	058X272	10.50	9.50
SN60	60/40	.062	058X276	10.50	9.50
SN62	62/36/2Ag	.031	058X303	25.00	22.50
SN63	63/37	.020	058X316	15.50	14.00
SN63	63/37	.031	058X326	9.00	8.20
SN63	63/37	.050	058X334	12.00	10.75
SN63	63/37	.062	058X338	9.50	8.50



Chem-Wik® Lite Desoldering Braids

- Faster and cleaner than other braids
- Pure copper braid for highest thermal conductivity
- Made using Type R (Mil-F-14256D) water white rosin flux
- 42-gauge wire for fast-acting desoldering
- Especially suited for low temperature irons

Chem-Wik Lite is an instant solder remover that can be used for all desoldering applications. It removes solder faster and more effectively than conventional desoldering wicks, significantly reducing rework and repair costs. It is an advanced ultra-thin desoldering wick made of 42-AWG pure copper braid which allows for better thermal conductivity, even at low temperatures. With Chem-Wik Lite, overheating of critical heat-sensitive components and circuits is minimized because it requires less heat for a shorter time. Chem-Wik Lite also requires less contact pressure for greater operator comfort. It contains ultrasonically applied pure rosin flux which hermetically protects the deoxidized copper braid and promotes solderability.



This unique process assures perfectly uniform and smooth flux distribution that will not become brittle or flaky, even after extended periods of storage. It is economical and will thoroughly clean the work-piece in about one second for less than 1/2 cent per connection. It is also more efficient and convenient than suction devices and is used extensively throughout the electronics industry. Chem-Wik Lite desoldering braids are easy to use. Aside from a soldering iron, no special equipment or training is required. Simply place Chem-Wik Lite against the connection to be desoldered, then place a hot soldering iron on top of the wick.

As the solder melts, it will instantly move up the wick by capillary action, leaving the connection perfectly clean and in a resolderable condition. After use, clip the used portion of wick from the spool and Chem-Wik Lite is ready to desolder the next joint. Chem-Wik Lite Desoldering Braid is available in all six popular sizes ranging from .025 to .190 inches and can be purchased on 5-, 25- or 500-foot spools.



Braid Width Label Color	Stock No.	Part No.	Spool Length	Prices	
				1-99	100-up
.025" WHITE	348X501	2-5L	5'	\$ 2.00	\$1.70
	348X505	2-25L	25'	8.50	7.25
	348X511	2-500L	500'	160.00	
.050" YELLOW	348X521	5-5L	5'	\$ 2.00	\$1.70
	348X525	5-25L	25'	8.50	7.25
	348X531	5-500L	500'	160.00	
.075" GREEN	348X541	7-5L	5'	\$ 2.00	\$1.70
	348X545	7-25L	25'	8.50	7.25
	348X551	7-500L	500'	167.00	

Braid Width Label Color	Stock No.	Part No.	Spool Length	Prices	
				1-99	100-up
.100" BLUE	348X561	10-5L	5'	\$ 2.00	\$1.70
	348X565	10-25L	25'	9.25	8.00
	348X571	10-500L	500'	178.00	
.150" BROWN	348X581	15-5L	5'	\$ 2.50	\$2.25
	348X585	15-25L	25'	10.75	9.25
	348X591	15-500L	500'	210.00	
.190" RED	348X601	19-5L	5'	\$ 2.50	\$2.25
	348X605	19-25L	25'	11.50	9.75
	348X611	19-500L	500'	225.00	



Desoldering Tools

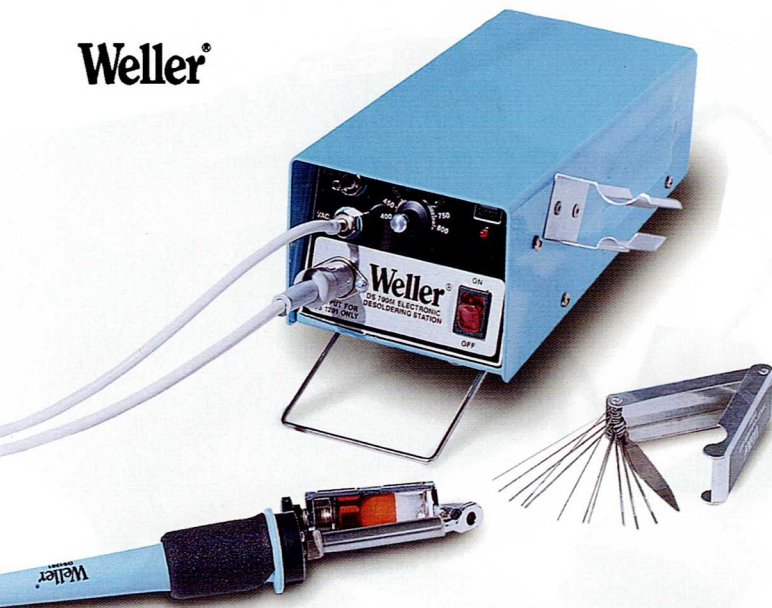
EDSYN®

For occasional use, often the fastest and easiest way to desolder components is by utilizing a hand-type, manual desoldering tool. These tools have been industry favorites for almost 20 years and have proven to be both a very reliable and effective means of desoldering. We offer three tools from Edsyn Inc. (A) DSO17 deluxe desoldering tool is the workhorse of the industry because of its ability to draw a large vacuum for working with larger components. (B) AS196 is the same basic tool as the DSO17 except that it is made to be completely conductive, allowing it to be used around static-sensitive equipment. (C) SS750LS is a new compact-sized (conductive) tool for field or occasional use. From Paladin, we offer (D) 1700 standard metal-body tool that has become a favorite of technicians everywhere, (E) 1701 mini-tip tool for working in confined environments or with extra-small components and (F) 1704 conductive tool designed for working with static-sensitive components. All tools feature replaceable tips.

A. 038X017 DSO17 Tool	1-11,	\$19.90 ea.;	12-up,	\$17.00 ea.
038X012 SRT-12 (Repl. Tip)	1-11,	3.20 ea.;	12-up,	2.75 ea.
B. 038X196 AS-196 Tool	1-11,	\$25.50 ea.;	12-up,	\$23.00 ea.
038X197 LS-197 (Repl. Tip)	1-11,	4.95 ea.;	12-up,	4.25 ea.
C. 038X755 SS750-LS Tool	1-11,	\$8.50 ea.;	12-up,	\$7.65 ea.
038X751 LS-751 (Repl. Tip)	1-11,	1.80 ea.;	12-up,	1.65 ea.
D. 170X150 1700 Tool	1-11,	\$16.00 ea.;	12-up,	\$14.50 ea.
170X370 2712 (Repl. Tip)	1-11,	3.95 ea.;	12-up,	3.50 ea.
E. 170X155 1701 Tool	1-11,	\$17.50 ea.;	12-up,	\$16.00 ea.
170X380 2714 (Repl. Tip)	1-11,	4.45 ea.;	12-up,	4.00 ea.
F. 170X160 1704 Tool	1-11,	\$19.50 ea.;	12-up,	\$18.00 ea.
170X385 2716 (Repl. Tip)	1-11,	5.50 ea.;	12-up,	5.00 ea.



Weller



Model DS700M

Mini Desoldering System

Weller's Mini Desoldering System DS700M is a small package filled with big advantages. This lightweight, compact, electronic power desoldering unit makes a small footprint on the bench and is easy to carry in the field. Tapered, self-sealing, iron-plated copper tiplets deliver good heat transfer and are interchangeable without recalibrating the power unit.

An LED indicator flashes when calibrated temperature is reached. You get $\pm 10^\circ\text{F}$ control in a $350^\circ\text{--}850^\circ$ range. A low-voltage, UL-approved transformer isolates the desoldering tool and vacuum pump from the ac line. Model DS700M's power unit has a large-capacity air filter that backs up the small filter in the tool's solder collection reservoir. Hot air output is available for low-volume heat shrinking.

Model DS700M's high-tensile aluminum case and electronic zero-cross switching make it ideal for ESD-sensitive and defense contract work. This mini desoldering system includes tool, stand, four tiplets (.025", .036", .071" and .045" ID) plus instruction sheet. The 4-pound unit measures 4" x 3.25" x 8". One-year warranty.

104X180 DS700M Desoldering System...1-2, \$687.00 ea.; 3-up, \$632.00 ea.

104X150 DS110T (.025" ID) Tiplet....1-9, 12.00 ea.; 10-up, 11.00 ea.

104X152 DS112T (.036" ID) Tiplet....1-9, 12.00 ea.; 10-up, 11.00 ea.

104X154 DS114T (.071" ID) Tiplet....1-9, 12.00 ea.; 10-up, 11.00 ea.

Model SC-7000

Desoldering Tool

This unique desoldering tool plugs directly into the ac outlet. The compact, multi-function tool features an integrated diaphragm vacuum pump, eliminating the need for a bench-top pump station and connection hoses. Direct in-line connection between the pump and tip provides high vacuum efficiency, allowing eight- to 12-layer pcbs to be worked. The sophisticated temperature control unit inside the hand-grip portion provides fast heat buildup and prompt recovery. For SMD component removal, simply switch to Hot Blower. The housing contains carbon, preventing ESD damage to sensitive components like integrated circuits. Advanced design makes the easily transported instrument ready to perform at any location inside or out.

The SC-7000 includes a stand for bench-top use, two-piece filter cartridge, cleaning pin set, wrench and operating manual. SMD Accessory Kit, replacement tips and filters are optional. The six-piece SMD Accessory Kit enables easy removal of SMD components. It includes hot-blow nozzle, hot-blow cartridge, spool of stainless steel wire with holder for QFP and SOP removal plus roll of stainless steel foil with stainless steel blade for PLCC removal. The 1-pound SC-7000 is 8.38" x 7.63" x 1.63". Six-month warranty.

813X700 SC-7000 Desoldering Tool.....1-5, \$468.00 ea.; 6-up, \$421.00 ea.

813X400 51-78-00 Optional Six-Piece SMD Accessory Kit.....50.00 ea.

813X200 0.8 MM Repl. Tip (Small).....37.00 ea.

813X210 1.0 MM Repl. Tip (Medium) *37.00 ea.

813X220 1.5 MM Repl. Tip (Large).....37.00 ea.

813X450 Repl. Filters (5 pc.).....20.00 ea.

* Standard tip supplied with SC-7000



dic DEN-ON
INSTRUMENTS
CO., LTD.



SD Kit 71-00-00

SMD Removal Kit

The optional DIC Desoldering Tool SD Kit is designed exclusively for use with the Den-On SC-7000. Use the SMD removal head to remove 23 x 17 devices and Allen wrench to tighten heads of inset screws. The suction assembly attaches directly to Model SC-7000. One-touch SMD removal is easy with the suction cup. This kit contains SMD removal head, suction assembly and four spare suction cups protected in a see-through plastic case.

813X500 SD Kit 71-00-00.....1-5, \$125.00 ea.; 6-up, \$112.50 ea.

Optional SMD Removal Heads

Stock No.	Part No.	Description	Price
813X570	71-03-00	Repl. Suction Cup (5/pkg.)	\$15.00 ea.
813X591	71-11-00	Suction Assembly	65.00 ea.
813X050	08-50-00	SMD Head Holder	19.00 ea.
813X551	71-01-01	SMD Removal Head, 23 x 17	50.00 ea.
813X552	71-01-02	SMD Removal Head, 30 x 30	55.00 ea.
813X553	71-01-03	SMD Removal Head, 15.5 x 15.5	69.00 ea.
813X554	71-01-04	SMD Removal Head, 12.5 x 12.5	69.00 ea.
813X555	71-01-05	SMD Removal Head, 20 x 20	72.00 ea.
813X556	71-01-06	SMD Removal Head, 16.5 x 16.5	72.00 ea.





Model 4624P Standard Service Center

- Self-contained vacuum source
- Use anywhere with electrical plug-in outlet
- Control switch conveniently located on handle
- Ergonomically designed handle reduces fatigue, increases productivity

Model 4624P is designed for simultaneous, independently controlled soldering and desoldering. Use this dual-function, self-contained unit with quiet

internal pump for most repair and rework applications. Precise, spike-free electronic temperature control and 24-volt design assure safety and accuracy.

Soldering mode is temperature controlled from 550° F to 850° F with standard 5098A durable macro-size iron or optional 9911AS delicate micro iron. A switch instructs control board to match correct calibration to proper handle. Desoldering mode is temperature controlled from 500° F to 850° F. Switch control board from desolder to solder for concurrent operation of two irons. Adjustable iron holders provide operator flexibility.

This three-wire grounded model is rated at 120 V/60 Hz. A mil-spec unit, it is UL and CUL listed plus ESD safe. The 10.2-pound unit measures 8.5" x 7.5" x 6.5". Two-year warranty.

094X399 4624P Standard Service Center\$706.00 ea.

094X920 9911AS High-Capacity Micro Iron Only\$86.00 ea.

Replacement Desoldering Tips for 4624/4924

Tip No.	Stock No.	Inside Dia.	Outside Dia.	Depth	Length
2005	094X347	.032	.060	.12	.75
2006	094X348	.040	.080	.12	.75
2007	094X349	.062	.100	.12	.75
2009	094X351	.062	.100	.37	1.00
2010	094X352	.032	.060	.015	.64
2011	094X353	.040	.080	.015	.64

All tips: 1-9, \$11.25 ea.; 10-up, \$10.15 ea.



Model 4924P Deluxe Service Center

- Self-contained vacuum source
- Temperature controlled
- Foot-pedal controller
- Extensive option package available

Ungar's top-of-the-line service center is a complete bench repair and rework system that does it all. Model 4924P will handle virtually all electronic repair and rework applications. A quiet internal pump eliminates the need for shop air. It can be powered continuously or with a foot pedal.

Three voltage ranges allow Model 4924P to work with a broad range of tools. Two sizes of soldering irons and a desoldering tool are included. It will simultaneously temperature control either of the soldering irons and the desoldering handle or both soldering irons. An adjustable angled iron holder allows the unit to be customized to suit the operator.

Soldering mode is temperature controlled from 550° F to 850° F with standard 9931AS macro-size iron and 9911AS micro iron. A two-position switch instructs the control board to match correct calibration to the proper handle. Desoldering mode is temperature controlled from 500° F to 850° F. A switch converts the 4098 desoldering handle into a compact heat gun by reversing vacuum to positive hot airflow.

Two Soldering Irons may be purchased separately. Choose from the durable 9931AS for tough jobs or the slim-profile 9911AS for electronic soldering. When combined with the 4375 Option Kit, this deluxe service center becomes the most complete rework station available anywhere. The 17.7-pound ESD-safe, mil spec unit is 14" x 8" x 6.5". Two-year warranty.

094X398 4924P Deluxe Service Center\$1449.00 ea.

094X928 9931AS High-Capacity Macro Iron Only\$86.00 ea.

094X920 9911AS Micro-Size Iron Only\$86.00 ea.

4375 Option Kit

Purchase the 4375 Option Kit to turn your 4924 Deluxe Service Center into an extensive rework center. Includes drill motor, grinding/milling/polishing/drilling tools, thermal wire stripper, resistance soldering tweezers, Trac-Aid® PC repair kit and desoldering tip assortment.

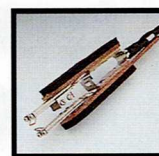
094X393 4375 Option Kit\$825.00 ea.



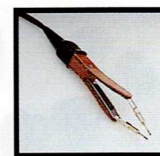
Drill Motor



Accessory Center



Wire Stripper



Tweezers



Model FCR-2201

Complete SMT Workstation

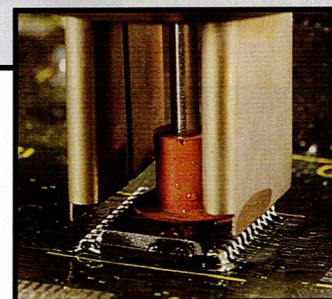
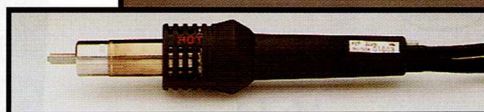
Model FCR-2201 is a forced convection rework system that also provides vacuum pick-up for easy removal or replacement of SMT components. Utilizing a self-contained air source, the FCR-2201 regulates air flow and temperature to rework a wide range of components from discretes to PLCC and QFP.

For flexibility, unique three-mode operation provides manual or semi-automatic control for component removal or replacement. In Manual Mode, a foot switch allows continuous hot airflow, on-demand airflow or on-demand vacuum. Auto Remove Mode provides sequenced and timed hot air, hot air with vacuum, hot air shut off and vacuum release. Auto Replace Mode offers sequenced and timed vacuum, hot air and hot air shut off.

The handpiece supplied with the FCR-2201 is the popular FCT-2228. This focused convection tool has a spring loaded vacuum tube which virtually eliminates mechanical stress when contacting the compound. An added convenience is the adjustable length of the vacuum tube. The operator can extend the tube for better viewing during placement or retract it so the nozzle can encapsulate the component during reflow. The nozzles are designed to focus heated air on component leads while impeding heat flow to adjacent areas. The FCT-2228 handpiece can be used with a wide range of nozzles. Simply change nozzle type to work with discretes, SOIC, PLCC or QFP. This feature really expands this system's capabilities. The included N-D25 nozzle works with discretes. A supplied nozzle removal tool provides quick and easy changes.

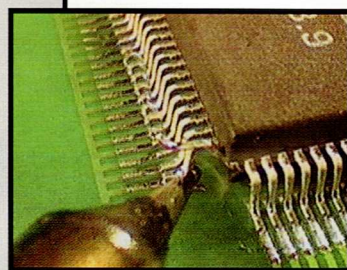
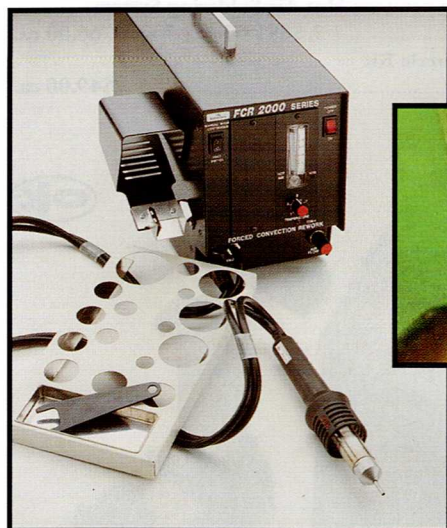
To monitor your work, the unit provides an air flow meter and temperature control module. Mode selection lets you choose Manual, Auto Remove or Auto Replace. Use the heater timer in Auto Remove or Auto Replace mode to select in the 0- to 180-second range.

The basic FCR-2201 includes a dual footswitch that provides vacuum and heater activation, handpiece holder, multiple nozzle holder, 10 high-temperature silicone rubber vacuum pads, vacuum removal tool, nozzle removal tool and extensive operations manual. At 19 pounds, the FCR-2201 has a small footprint at only 13" x 8" x 9". One-year warranty.



Model WSA is an innovative RTS-A hand tool holder with base and RBH-A adjustable board holder. Utilize these fixtures for true hands-free operation. Spring loaded for quick changes and adjustable to 13.5" boards, these fixturing devices feature heavy-duty aluminum and stainless steel construction. The RTS-A hand tool holder swings out of the way for other rework applications. This RTS/RBH fixturing combination measures 18" x 13" x 16" and weighs an additional 25 pounds. One-year warranty.

122X090 FCR-2201 Workstation....1-2, **\$1758.00 ea.**; 3-up, **\$1583.00 ea.**
122X919 WSA Tool/Board Holder..1-2, **1425.00 ea.**; 3-up, **1283.00 ea.**



FREE Demonstration/Installation Video now available for the FCR Series. Call the SPC Sales Department at (800) 866-5353 to request 122X835 (V-FCR-NTSC) at no charge.

Model FCR-2101

Self-Contained Hot Air Rework System for SMT

The economical FCR-2201 Hot Air Rework System is ideal for removing or replacing discrete, SOIC, PLCC and QFP components. Air flow is variable from 3 to 20 liters per minute and can be adjusted to the thermal demands of the board. High-efficiency diaphragm pump provides self-contained air source, eliminating the need for shop air and making set up quick and easy. An air flow meter and temperature control module aid in monitoring settings while you work. Use the handy footswitch for on-demand hot air. This 115-V ac system is fully grounded and static safe.

Model FCT-2128 forced convection handpiece includes 300-W heater with 392°-932° F operating range, closed loop, thermocouple sensor feedback, cord and connector. Use N-D25 nozzle with discretes. Over 40 nozzles are available. Use nozzle removal tool for quick, easy nozzle changes to work with discretes, SOIC, PLCC or QFP. This feature expands the system's capabilities. System also includes power base with pump, handpiece holder, multiple nozzle holder and manual. The 19-pound unit is 13" x 8" x 9". One-year warranty.

122X088 FCR-2101 Hot Air Rework System for SMT.....1-2, **\$1230.00 ea.**; 3-up, **\$1107.00 ea.**

Optional FCR Nozzle Kits for Models FCR-2201 and FCR-2101

Choose from four optional FCR Nozzle Kits to make the above OK SMT Rework Systems more versatile. These nozzles are designed to focus

heated air on the component leads while impeding heat flow to adjacent areas. Use them to encapsulate a wide range of components during reflow.

Stock No.	Part No.	Description	Price
122X513	NK-SOD8	SOIC Nozzle Kit includes: N-D25A, N-D4515A, N-S8, N-S16, N-SL20, N-SL24, N-SL28	\$ 713.00
122X510	NK-PLCC7	PLCC Nozzle Kit includes: N-P20, N-P28, N-P32, N-P44, N-P52, N-P68, N-P84	689.00
122X511	NK-QFP7	QFP Nozzle Kit includes: N-Q10, N-Q14, N-Q1420, N-Q28, N-BQ23, N-BQ28, N-BQ38	689.00
122X508	NK-EZ12	Mixed Nozzle Kit includes: N-D25A, N-P20, N-P28, N-P44, N-P52, N-P68, N-P84, N-Q1420, N-S8, N-S16, N-SL24, N-BQ23	1188.00

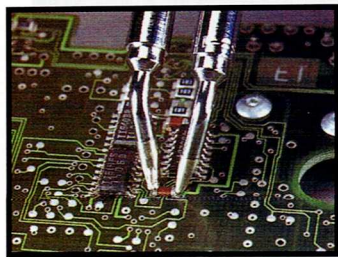




SMTweezer

Variable-Temperature-Control SMD Removal System

The SMTweezer is a single-output modular soldering system for mixed technology boards. Use it to remove PLCC, SOIC and discretes. Precision tips contact leads simultaneously.



This SMD Removal System features variable, tri-temp and fixed temperature controls with a 600-800° F range. The SMTweezer is comfortable to hold, and the power base provides easy selection of soldering temperature. Manufactured from static-dissipative material, the housing encloses a UL/CSA-approved multitap transformer.

Model SA-1441-V includes power base, variable temperature control module, soldering iron with

stand, tip, sponge, sponge tray and instruction manual. It operates at 115 volts, two x 40 watts. The 14-pound SMTweezer system has a 9" x 4" x 9.5" power base. Accessories are also available separately. One-year warranty.

SA-1441-V SMTweezer SMD Removal System

122X661 1-2, \$446.00 ea.; 3-up, \$402.00 ea.

SAI-640 Micro Soldering Iron Handpiece

122X680 \$76.00 ea.

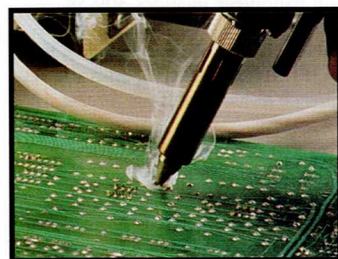
SAI-690 Macro Soldering Iron Handpiece

122X682 \$76.00 ea.

Model BTR-1201-V

Variable-Temperature Modular Desoldering System

This modular desoldering system provides maximum application flexibility for soldering and desoldering of both conventional and SMT components. Model BTR-1201-V is the highest power closed-loop temperature feedback system available. It is suited for a variety of work environments by providing a connectorized variable temperature module with a range of 600-800° F. Use it for both standard and multi-layer desoldering.



A unique combination of RTD sensor feedback, 110-watt power and high-mass desoldering nozzle provides the most efficient and consistent desoldering system available to the industry. This modular station offers efficient and consistent results, particularly for boards with high-thermal demand. Its self-contained vacuum has a high-volume, quick-rise internal pump. The 110-watt, 28-volt desoldering handpiece provides operator safety. Position the detachable handpiece holder anywhere on the bench for the maximum in operator convenience. This static-safe system meets all requirements of MIL-STD-2000A and 1686A.

The BTR-1201-V system comes complete with power base, variable-temperature control module, desoldering tool and holder, solder path cleaning pin, filter set (five felt and five steel wool) plus nozzle. It operates at 115 volts ac, 50/60 Hz. The 14-pound system has a power base measuring 9" x 4" x 9.5" with a 6" x 2" x 9.5" desoldering gun holder. One-year warranty.

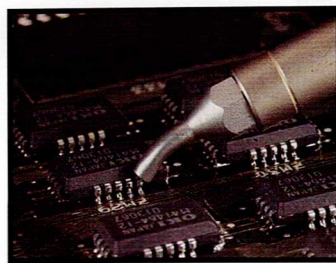
BTR-1201-V Modular Desoldering System

122X031 1-2, \$689.00 ea.; 3-up, \$621.00 ea.

Model SMT-1161-V

Variable- Temperature Hot Air Soldering System

Model SMT-1161-V is a non-contact Hot Air Soldering System for use with most heat-sensitive SMT components. Utilizing forced air convection, it is designed for low thermal-stress reflow. Temperature-sensitive ceramic capacitors can be safely soldered using this recommended method. Primarily a soldering device, SMT-1161-V can be utilized for SMT component removal of chips and SOIC. Non-contact soldering eliminates alignment disruption and thermal shock to components.



Features include variable closed-loop temperature control with 600-800° F range, 60-watt quick-response heater and variable airflow control. This system provides digital or analog temperature control. Housing and handpiece are ESD safe. Nitrogen input facility is provided for inert soldering applications. Oval, round and angled

nozzles offer specialized split, fan and fine nozzle options.

The SMT-1161-V includes base with self-contained air pump, control module, handpiece with holder, three-piece nozzle kit and instruction manual. Operates at 115 volts ac. The 8.8-pound housing measures 5.7" x 4.3" x 8.5". One-year warranty.

SMT-1161-V Variable-Temperature Hot Air Soldering System

122X684 1-2, \$851.00 ea.; 3-up, \$766.00 ea.

NK-1060A Three-Piece Nozzle Kit

122X506 \$49.00 ea.





VIRTUAL INDUSTRIES, INC.

PEN-VAC™

Vacuum Pickup Tool

PEN-VAC™ picks up SMDs and components with flat surfaces. It is ideal for clean-rooms, SMT handling, electronic assembly, labs or any industry requiring manipulation of small objects. This ESD-safe vacuum pickup tool increases productivity and decreases accidental loss of parts. The lightweight, brushed aluminum, pen-shaped body fits conveniently in a pocket. A storage compartment is provided for spare tips and vacuum cups. The manual, self-contained vacuum can pick up flat objects weighing up to 60 grams with the 1/4" vacuum cup and up to 500 grams with a 3/4" cup. No external power, air or vacuum is needed.

The 1-ounce tool measures 5.75" long by .5" in diameter. It includes four probes: one straight (.07), two angled (.07) and one small angled (.05 O.D.). You also get four black, high-temperature-resistant, ESD-safe vacuum cups: one 1/8", two 1/4" and one 3/8". The replacement set of these probes and cups is available separately. A six-piece set of 1/8"-3/4" black, high-temperature-resistant, ESD-safe vacuum cups is optional. Ninety-day warranty.

128X800 V8901-A-ESD PEN-VAC.....1-11, \$52.00 ea.; 12-up, \$47.00 ea.

128X900 V9000-K Vacuum Cup Set (6).....10.00 set



Model PGA-X

Universal PGA Extraction/ Insertion Tool

Pin grid array (PGA) extraction and insertion capabilities are conveniently combined in one affordable tool from OK Industries. The all new PGA-X provides the most inexpensive, effective means for both extracting and inserting all sizes of PGAs. Adjustable for 9 x 9 to 26 x 26 pin sizes, Model PGA-X eliminates the expense of purchasing multiple fixed-size tools, saving you hundreds of dollars.

It features smooth, even, lead screw operation with no damage to boards, pins or sockets. One-handed operation lifts parts evenly without damage to device, socket or board. Model PGA-X easily accesses sockets in densely populated areas on the circuit board. Surrounding components on a circuit board can be as close as .100" without interfering with the tool's operation. A heavy-duty storage case protects the tool when it is not in use.

122X632 PGA-X Extractor/Insertion.....1-5, \$220.00 ea.; 6-up, \$198.00 ea.



Model EX-6

Universal PLCC Extractor

Use this low-cost extraction tool for easy PLCC removal from any socket without damaging the chip, socket or component. The EX-6 accommodates PLCC sizes ranging from 20 pins through 84 pins. It features ABS handles and stamped steel. The spring-loaded, one-handed design enables easy extraction with no pulling required. Just a squeeze of the handles lifts the chip from the socket.

EX-6 Universal PLCC Extractor

122X0851-11, \$7.00 ea.; 12-up, \$6.00 ea.



Model WK-7

Insertion/ Extraction Kit

For a wide range of insertion/extraction needs in an inexpensive, useful combination of tools, choose the versatile Model WK-7 from OK Industries.

This convenient kit includes DIP IC extractors and inserters to accommodate all ICs from eight to 40 pins. Durable construction of the kit components provides precise removal or insertion time after time. Mechanical operation offers an inexpensive but effective alternative to the more complex insertion/extraction systems.

Each of the five pieces is easily operated with one hand, and each tool lifts or inserts parts evenly without damage to the device, component or board. For safety of surrounding parts, be assured that all tools that engage conductive surfaces are CMOS safe and include grounding lugs where appropriate. The MOS-1416 insertion tool has a .3" pitch for use with 14 to 16 pins. Model MOS-2428 has a .6" pitch for inserting 24- to 28-pin components. Use the MOS-40 with 36 to 40 pins. This five-piece kit comes with two extractors. One-piece steel construction of the EX-1 provides simple operation for extraction of chips from eight to 24 pins. Model EX-2 will extract chips from 24 to 40 pins.

122X916 WK-7 Inserter/Extractor Kit.....1-5, \$67.00 ea.; 6-up, \$61.00 ea.



Erem

I.C. Insertion/Extraction Pliers

A. Model 508ER DIP/IC Lead Straightening Plier

A unique instrument that straightens multiple DIP/IC leads in a single operation without damage to the component.

097X367 Model 508ER.....1-11, \$82.00 ea.; 12-up, \$76.25 ea.

B. Model 507DU2 DIP/IC Extractor Plier

The special head design allows positive gripping power for those difficult-to-extract ICs. Will extract most DIPs/ICs.

097X365 Model 507DU2.....1-11, \$79.75 ea.; 12-up, \$74.25 ea.

C. Model 505C DIP/IC Insertion/Extraction Plier

Designed to handle 14- to 16-pin IC packages. Adjustable set screw allows lead spread to be reduced from .350 in. to .300 in.

097X362 Model 505C.....1-11, \$102.50 ea.; 12-up, \$95.50 ea.

D. Model 505 DIP/IC Insertion/Extraction Plier

Designed for handling 18- to 22-pin IC packages. Closes lead spread from .450 in. to .400 in. in one easy operation.

097X359 Model 505.....1-11, \$75.50 ea.; 12-up, \$70.50 ea.

E. Model 505A DIP/IC Insertion/Extraction Plier

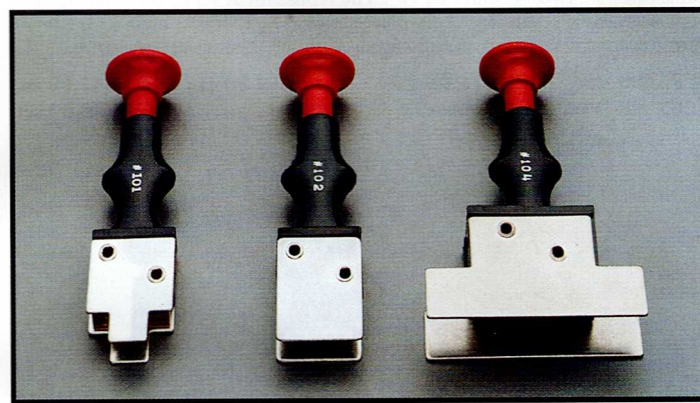
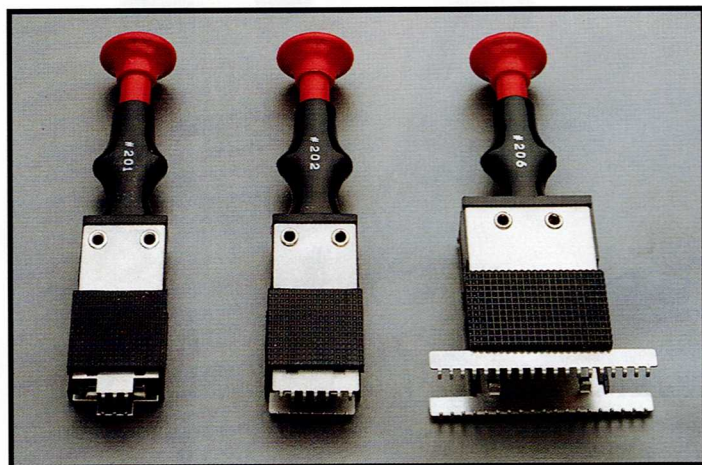
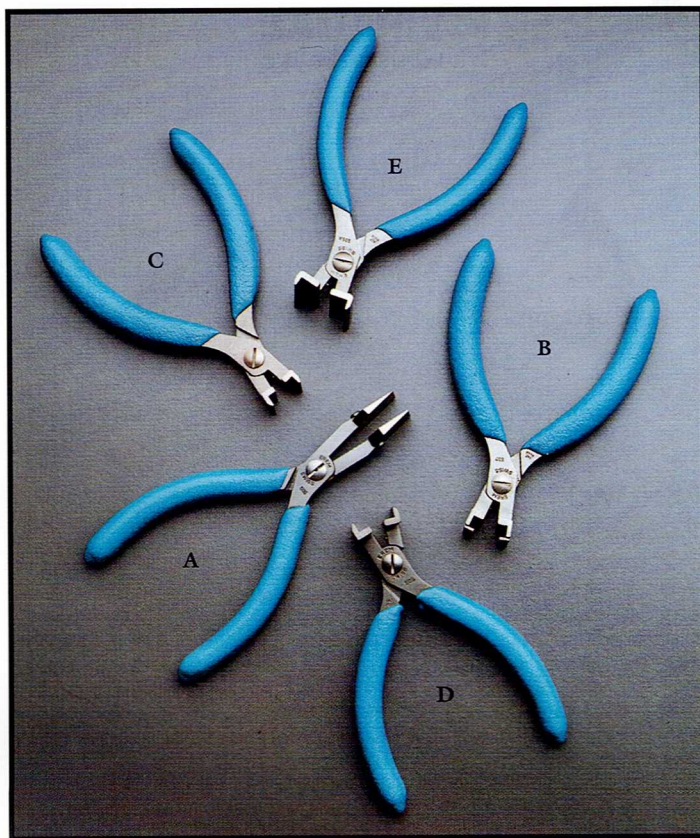
Ideal for handling 24-pin IC packages. Adjustable screw allows lead spread to be reduced from .650 in. to .600 in.

097X360 Model 505A.....1-11, \$75.50 ea.; 12-up, \$70.50 ea.

F. Model 505B DIP/IC Insertion/Extraction Plier (not pictured)

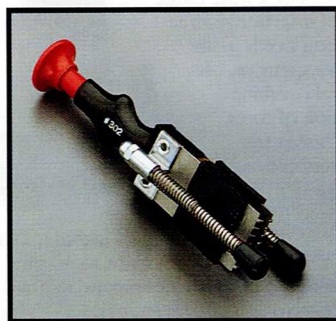
Ideal for handling 40-pin IC packages. Closes lead spread from .650 in. to .600 in. in one easy operation.

097X361 Model 505B.....1-11, \$79.75 ea.; 12-up, \$74.25 ea.



I.C. Extraction Tools

MES has developed a family of extraction tools that grasp the IC from the sides and under the body. The side plates of the tool are stainless steel and can act as heat sinks during desoldering as well as be grounded for MOS applications. Less than 0.1" room is required to get into high density boards. PUL-A-DIP is the only extraction tool available that will work with ICs that are butted end to end.



Standard Extraction Tools

Stock No.	Part No.	I.C. Size	Prices	
			1-11	12-up
086X201	201	6/8	\$35.00	\$31.80
086X202	202	14/16	32.00	29.15
086X203	203	24/28	38.00	34.50
086X206	206	36/40	38.00	34.50
Spring Loaded Extraction Tools (Inset)				
086X301	301	6/8	\$47.00	\$42.50
086X302	302	14/16	44.50	40.50
086X303	303	24	50.00	45.50

I.C. Insertion Tools

Integrated Circuits in Dual Inline Packages (DIP) present the problem of aligning all leads simultaneously to socket holes or holes in printed circuit boards. MES has developed a family of insertion tools that plumb those leads to the holes every time. IC manufacturers have continued the development of several different sizes ranging from 4 to 64 pin and packages that vary from .3" to .9".

To use the tool, push down over the top of an IC, plumbing the leads and capturing the IC in the tool by a friction fit. Take the IC to the pcb, align the leads on one side first, then rock the IC into the second line of holes. Using the forefinger on the red knob, push the knob down inserting the IC and ejecting it from the tool.

Insertion Tools

Stock No.	Part No.	I.C. Size	Prices	
			1-11	12-up
086X101	101	6/8	\$31.50	\$28.75
086X102	102	14/16	29.00	26.50
086X103	103	24/28	34.00	30.75
086X104	104	36/40	34.00	30.75
086X105	105	TO-5	47.00	42.50
086X110	110	18/20	41.00	37.50
086X112	112	22/24	41.00	37.50
086X100	100	(Set of All 7 Tools)	257.00	234.00



Cutters and Pliers

This selection features absolutely the finest cutters/pliers available anywhere. Produced in Switzerland, these EREM tools are built to the most demanding standards. They are manufactured by an advanced process, which completely eliminates forging. This unique manufacturing process, combined with specially alloyed steels, produces a cutting edge which outperforms all others.

Other features include: soft foam cushion handle grips for maximum comfort, an internal stop which limits the blade and handle opening to reduce operator fatigue and an integrated spring and screw assembly which is built into each tool and is guaranteed for life. In fact, it's this spring assembly that puts the magic in these Magic Line tools. Manufactured using a Swiss lamination technique, which is a multiple extrusion process that super-compacts the molecules of steel and implants extra strength to the finished product, ensures longer wear and virtually eliminates breakage.

All these features combine to make these tools last three to five times longer than conventional tools. They are the best pliers/cutters you can buy.

EREM

Model 544

Smooth Chain Nose Plier

This 4 $\frac{3}{4}$ " chain nose plier has smooth, radiused jaws for delicate forming and bending of wire leads. It is the smoothest action, most precise plier available for assembly work.

097X400 544.....1-11, \$57.75 ea.; 12-up, \$53.75 ea.

Model 543

Round Nose Plier

Model 543 is a 4 $\frac{3}{4}$ " round nose plier with smooth jaws. It is the perfect tool for precision forming or coiling of fine wire. This is a quality tool that will last a lifetime if used properly.

097X398 543.....1-11, \$56.90 ea.; 12-up, \$53.00 ea.

Model 582E

Angulated Flush Tip Cutter

This 4 $\frac{1}{2}$ " long maximum full flush tip cutter is ideal for module work. Designed for cutting .010-.030 nickel ribbon and 22-AWG and smaller soft wire. Features foam cushion grip handles and angulated-tip cutting lead.

097X440 582E.....1-11, \$74.75 ea.; 12-up, \$69.00 ea.

Model 593AE

DIP Cutting Flush Cutter

A 4 $\frac{1}{4}$ " long maximum full flush tip cutter, it is designed to get between the leads of a dual in-line package (DIP) and trim random leads without damaging the package. Unique angle of cutting edges and blades allows greater tool life and smoother, cleaner cut. Foam cushion handles.

097X470 593AE.....1-11, \$75.00 ea.; 12-up, \$69.85 ea.

Model 597E

Round Nose, Semi-Flush Cutter

This 4 $\frac{1}{4}$ " long semi-flush cutter is designed to cut most soft leads up to 16 AWG. Traditional round nose works well in high volume applications. Features foam cushion grip handles and round-type head.

097X456 597E.....1-11, \$57.50 ea.; 12-up, \$53.50 ea.

Model 576ED

Relieved Head, Full Flush Cutter

A 4" long maximum full flush cutter used for extremely fine cutting applications. Designed for cutting 22-AWG and smaller soft wire. Features foam cushion grip handles and relieved-type head for working in confined areas.

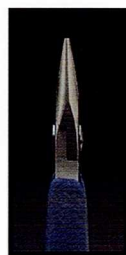
097X428 576ED.....1-11, \$58.50 ea.; 12-up, \$54.00 ea.

Model 595E

Tapered Head, Full Flush Cutter

Our most popular Utica Swiss cutter is a 4" long maximum full flush cutter for general-type cutting applications. Designed for cutting 18-AWG and smaller soft wire. Features foam cushion grip handles and tapered-type head.

097X450 595E.....1-11, \$47.25 ea.; 12-up, \$44.00 ea.



PRECISION HAND TOOLS



Super Cutters and Pliers

Swanstrom's Super Cutters and Pliers are made of Swedish American high chromium, high carbon, alloy forged steel for maximum tool life. This very wear resistant, ball bearing type steel and Swanstrom's unique heat treating process make these Super tools really super. They combine productivity, quality and safety.

Electronic induction hardening up to 65 HRC provides maximum cutter life. Hard alloy self-lubricating bearings plus precision machined and lapped joints assure perfect jaw alignment for longer life. Edges are induction heated, computer quenched and electrically

tempered to RD60+ for optimum combination of hardness and toughness for safe, long life and low cost per cut.

Lead catchers and shields restrict trimmed pieces from flying free or falling into critical work areas. Beautiful black oxide anti-glare finish minimizes visual fatigue and corrosion. Soft touch double action stainless steel leaf springs provide smooth minimum effort. They are adjustable for smooth action and increased productivity. Traditional handles are covered with soft-touch, static-dissipative, anti-fatigue foam grips to minimize ESD and CTS. Choose from assorted Super Cutters and Pliers to suit your needs.

5" Tapered Slim Flush Diagonal Cutter

S420: Flush cutting diagonal tool has tapered slim head. Maximum soft copper wire cutting capacity is .040"-18 ga.

490X420

1-11, \$29.25 ea.
12-up, 26.60 ea.

5" Oval Flush Diagonal Cutter

S511: Diagonal cutter features oval head shape and flush cutter edge. Maximum soft copper wire cutting capacity is .070"-13 ga.

490X511

1-11, \$29.25 ea.
12-up, 26.60 ea.

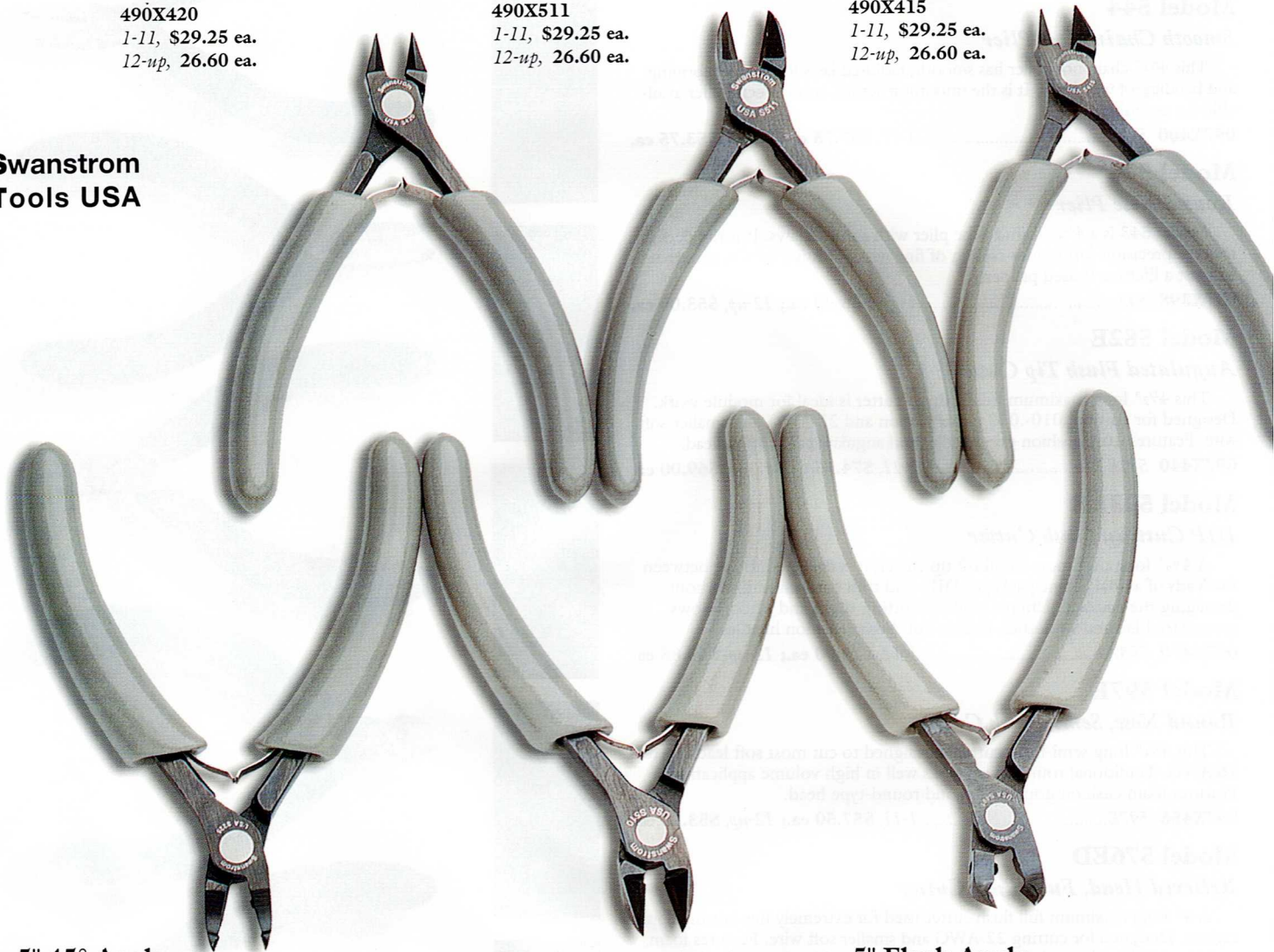
5" Tapered Flush Diagonal Cutter

S415: Flush cutting diagonal tool has tapered jaws. Maximum soft copper wire cutting capacity is .050"-16 ga.

490X415

1-11, \$29.25 ea.
12-up, 26.60 ea.

Swanstrom
Tools USA



5" 45° Angle Tip Cutter

S225: Angle end cutter has 45° long nose with super flush cutter edge. Maximum soft copper wire cutting capacity is .025"-22 ga.

490X225

1-11, \$35.50 ea.
12-up, 32.20 ea.

5" Oval Bevel Diagonal Cutter

S510: Bevel edge cutter has oval head. Maximum soft copper wire cutting capacity is .070"-13 ga.

490X510

1-11, \$29.25 ea.
12-up, 26.60 ea.

5" Flush Angle End Nipper

S491: This 60° angle end nipper has a flush cutter edge. Maximum soft copper wire cutting capacity is .025"-22 ga.

490X491

1-11, \$33.25 ea.
12-up, 30.10 ea.



5.3" Long Nose Pliers

S220/S221: Long nose head shape comes with smooth or serrated jaws.

490X220 S220 Smooth

1-11, \$16.25 ea.

12-up, 14.70 ea.

490X221 S221 Serrated

1-11, \$16.25 ea.

12-up, 14.70 ea.

6" Long Nose Smooth Jaw Pliers

S320: Long nose head shaped pliers feature smooth jaw type.

490X320

1-11, \$16.25 ea.

12-up, 14.70 ea.

6" Needle Nose Pliers

S330/S331: Needle nose head shaped pliers are available with smooth or serrated jaws.

490X330 S330 Smooth

1-11, \$16.25 ea.

12-up, 14.70 ea.

490X331 S331 Serrated

1-11, \$16.25 ea.

12-up, 14.70 ea.

**Swanstrom
Tools USA**

5" Round Nose Smooth Jaw Pliers

S236: Pliers feature round nose head shape with smooth jaw type.

490X236

1-11, \$30.75 ea.

12-up, 28.00 ea.

5" Long Slim Nose Smooth Jaw Pliers

S324: This super tool features long slim nose head shape and smooth jaw type.

490X324

1-11, \$16.25 ea.

12-up, 14.70 ea.

5" Curved Snipe Nose Smooth Jaw Pliers

S242: These pliers feature curved snipe nose head shape with smooth jaws.

490X242

1-11, \$20.00 ea.

12-up, 18.20 ea.

**Swanstrom
Tools USA**

Super Tool Kit

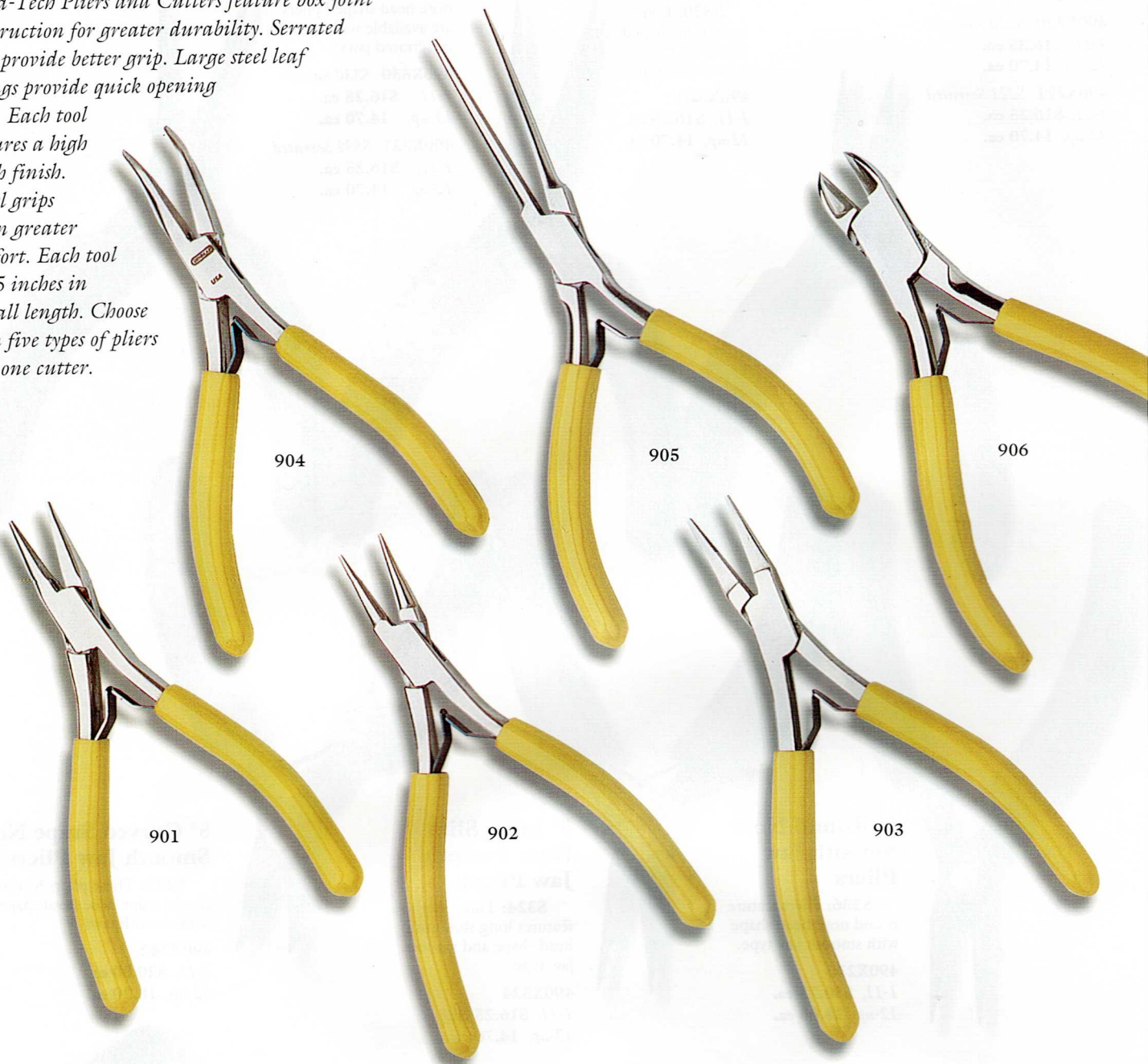
SK2: Six-piece electronic plier kit includes S415 Size 4 Tapered Super Flush Diagonal Cutter, S511 Size 5 Oval Flush Diagonal Cutter, S225 Size 4 Super Flush Angle Cutter, S242 Size 4 Curved Snipe Nose Smooth Jaw Pliers, S236 Size 4 Round Nose Smooth Jaw Pliers and S330SR Size 5 Needle Nose Smooth Pliers with Special Radius Jaws. Super Tool Kit's gray Cordura case has a three-sided zipper closure.

490X020 SK21-5, \$199.00 ea.; 6-up, \$181.00 ea.



Ultra-Tech Pliers and Cutters

These high-quality stainless steel tools will not rust. Ultra-Tech Pliers and Cutters feature box joint construction for greater durability. Serrated jaws provide better grip. Large steel leaf springs provide quick opening jaws. Each tool features a high polish finish. Vinyl grips mean greater comfort. Each tool is 4.5 inches in overall length. Choose from five types of pliers and one cutter.



4½" Curved Chain Nose Plier

904 — Small curved chain nose plier is ideal for getting into tight, hard-to-reach places.

904 Curved Chain Nose
046X904 ...1-11, \$11.00 ea.; 12-up, \$10.00 ea.

4½" Chain Nose Plier

901 — Use this chain nose plier for delicate electronic work. It is ideal for lead forming and parts handling.

901 Chain Nose Plier
046X901 ...1-11, \$11.00 ea.; 12-up, \$10.00 ea.

4½" Needle Nose Plier

905 — This needle nose plier is designed for reaching into tight places in small parts handling and lead forming applications.

905 Needle Nose Plier
046X905 ...1-11, \$11.00 ea.; 12-up, \$10.00 ea.

4½" Round Nose Plier

902 — A traditional round nose plier designed for lead and wire forming. It works well in high-volume applications.

902 Round Nose Plier
046X902 ...1-11, \$11.00 ea.; 12-up, \$10.00 ea.

4½" Diagonal Cutter

906 — Use this diagonal cutter for general trimming and cutting applications.

906 Diagonal Cutter
046X906 ...1-11, \$12.00 ea.; 12-up, \$10.50 ea.

4½" Flat Nose Plier

903 — This flat nose plier is used for lead forming and parts handling.

903 Flat Nose Plier
046X903 ...1-11, \$11.00 ea.; 12-up, \$10.00 ea.



Diagonal Cutting Plier

MS54 — General-purpose cutter with $\frac{7}{16}$ " cutting blade.

030X580 MS54 Plier.....1-11, \$12.75 ea.; 12-up, \$9.75 ea.

Tapered Diagonal Cutter

MS54-9J — Diagonal cutter with flush ground edges, tapered point and narrow tips.

030X589 MS54-9J Cutter.....1-11, \$14.00 ea.; 12-up, \$11.00 ea.

Thin Diagonal Cutter

MS54-3J — Diagonal flush cutter, ground down on back side for reaching into confined places.

030X584 MS54-3J Cutter.....1-11, \$14.50 ea.; 12-up, \$11.50 ea.

Flush Diagonal Cutter

MS54-5J — Diagonal cutter with straight sides and flush ground.

030X586 MS54-5J Cutter.....1-11, \$13.75 ea.; 12-up, \$10.75 ea.

Angled Flush Cutter

GA54-J — Four-inch cutting plier for soft wire only with flush ground blade angled at 29° .

030X286 GA54-J Cutter.....1-11, \$22.75 ea.; 12-up, \$17.55 ea.

Long Nose Pliers

LN Series — LN54/55 chain nose pliers have finely serrated jaws for gripping wires and components. LN54-G has smooth jaws.

030X535 LN54 (4" Serrated).....1-11, \$14.00 ea.; 12-up, \$11.00 ea.

030X537 LN54-G (4" Smooth).....1-11, 14.00 ea.; 12-up, 11.00 ea.

030X539 LN55 (5" Serrated).....1-11, 14.50 ea.; 12-up, 11.25 ea.

Needle Nose Pliers

NN Series — NN54/55 have scoring on jaws. NN54/55-G have smooth jaws with slightly rounded edges.

030X610 NN54 (4" Serrated).....1-11, \$16.50 ea.; 12-up, \$13.00 ea.

030X611 NN54-G (4" Smooth).....1-11, 16.50 ea.; 12-up, 13.00 ea.

030X613 NN55 (5" Serrated).....1-11, 16.50 ea. 12-up, 13.00 ea.

030X614 NN55-G (5" Smooth).....1-11, 16.50 ea.; 12-up, 13.00 ea.

Standard Lead Shear

Ungar's Model 170-M flushcutting lead shear has been the industry standard for over a decade. It features molded plastic grips and a blade by-pass design that shears leads rather than making a traditional cut. This unique action reduces hand fatigue by 50%. Its low profile head allows flush trimming in tight areas and its 54-56 Rockwell hardness allows cutting of common printed circuit components and wires down to 22 AWG leads. Comes complete with lifetime spring and cushion grip handles.

094X170 170-M Std. Shear.....1-11, \$5.75 ea.; 12-up, \$4.25 ea.

Super Shear Flushcutter

Ungar's Super Shear represents a major breakthrough in technology. Designed around a special alloy steel that has been heat treated to produce a Rockwell hardness of 59-61, this super strength enables it to cut Kovar, Dumet, IC, transistor and diode leads down to 22 AWG with ease, yet transfers only a minimal shock to the component being trimmed. Other features include a low profile head with a by-pass feature that shears the leads and ergonomically designed, molded plastic handles.

094X175 170-D Super Shear.....1-11, \$12.50 ea.; 12-up, \$8.00 ea.

A-N Connector Plier

Unique plier has been an industry favorite for many years. It is designed to fit most A-N electrical connectors. The tool is made of high quality, alloy steel with a chrome plating for maximum durability. It features replaceable nylon jaw inserts to ensure protection of the connectors and a three-adjustment position handle for handling most all size connectors. Tool comes complete with one pair of nylon inserts.

098X174 529-10 Plier.....1-11, \$24.50 ea.; 12-up, \$22.75 ea.

098X360 529-10 Repl. Insert Kit (with Screws).....4.50 ea.

TRIANGLE
TOOL GROUP, INC.



MS54



MS54-9J



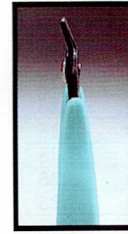
MS54-3J



MS54-5J



GA54-J



LN54



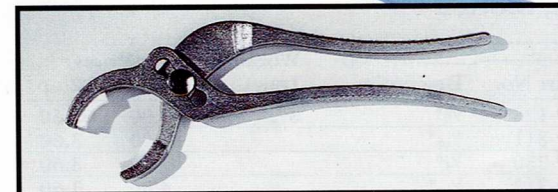
NN54

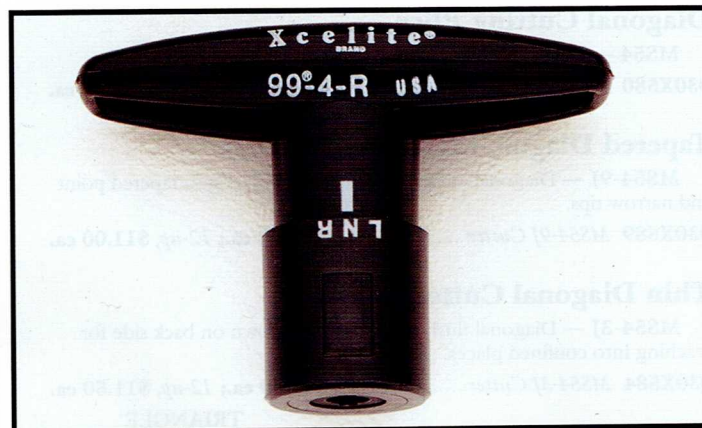


170-M



170-D





Standard Handles

Stock No.	Part No.	Description	Prices	
			1-11	12-up
108X158	99-1	Regular (1 1/16" x 4 1/8")	\$ 4.25	\$ 3.90
108X159	99-1-R	Ratcheting, Regular (1 1/4" x 4 1/2")	28.00	25.50
108X160	99-2	Junior (1" x 3 1/8")	4.00	3.60

Nutdrivers

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X170	99-6	3/16"	3 5/8"	\$4.00	\$3.60
108X172	99-7	7/32"	3 5/8"	4.00	3.60
108X175	99-8	1/4"	3 5/8"	4.00	3.60
108X176	99-8M	1/4" Magnetic	3 5/8"	5.50	5.00
108X138	99-S-8	1/4" Stubby	1 3/8"	3.20	2.90
108X178	99-9	9/32"	3 5/8"	4.00	3.60
108X180	99-10	5/16"	3 5/8"	4.00	3.60
108X181	99-10M	5/16" Magnetic	3 5/8"	5.50	5.00
108X139	99-S-10	5/16" Stubby	1 3/8"	3.20	2.90
108X183	99-11	11/32"	3 5/8"	4.20	3.80
108X185	99-12	3/8"	3 5/8"	4.20	3.80
108X140	99-S-12	3/8" Stubby	1 3/8"	3.20	2.90
108X187	99-14	7/16"	4"	5.25	4.75
108X188	99-16	1/2"	4"	5.25	4.75

Screwdrivers, Allen Hex Type

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X195	99-20	.050"	4"	\$3.60	\$3.25
108X197	99-21	1/16"		3.60	3.25
108X199	99-22	5/64"		3.60	3.25
108X201	99-23	3/32"		3.60	3.25
108X246	99-764	7/64"		3.60	3.25
108X203	99-24	1/8"		3.60	3.25
108X260	99-964	9/64"		3.60	3.25
108X205	99-25	5/32"		3.60	3.25
108X207	99-26	3/16"		3.60	3.25

Screwdrivers, Phillips

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X252	99-820	#0	3 7/8"	\$4.00	\$3.60
108X254	99-821	#1		4.00	3.60
108X256	99-822	#2		4.00	3.60

Screwdrivers, Slotted

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X240	99-125	1/8"	3 7/8"	\$4.00	\$3.60
108X250	99-811	3/16"		4.00	3.60
108X242	99-250	1/4"		4.00	3.60
108X244	99-312	5/16"		4.00	3.60

Stock No.	Part No.	Description	Prices	
			1-11	12-up
108X161	99-3	Stubby (1 1/16" x 2")	\$ 4.00	\$ 3.60
108X162	99-4	Tee (3 1/2" x 1 5/8")	5.40	4.90
108X163	99-4-R	Ratcheting, Tee (3 1/2" x 2 5/8")	28.00	25.50

Balldrivers, Allen Hex Type

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X196	99-20BP	.050"	4"	\$6.00	\$5.40
108X198	99-21BP	1/16"		6.00	5.40
108X200	99-22BP	5/64"		6.00	5.40
108X202	99-23BP	3/32"		6.00	5.40
108X247	99-764BP	7/64"		6.00	5.40
108X204	99-24BP	1/8"		6.00	5.40
108X261	99-964BP	9/64"		6.00	5.40
108X206	99-25BP	5/32"		6.00	5.40
108X208	99-26BP	3/16"		6.00	5.40

Nutdrivers, Metric Sizes

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X165	99-4MM	4 mm	92.08 mm	\$4.50	\$4.05
108X166	99-4.5MM	4.5 mm	(3 5/8")	4.50	4.05
108X167	99-5MM	5 mm		4.50	4.05
108X168	99-5.5MM	5.5 mm		4.50	4.05
108X171	99-6MM	6 mm		4.50	4.05
108X173	99-7MM	7 mm		4.50	4.05
108X177	99-8MM	8 mm		4.50	4.05
108X179	99-9MM	9 mm		5.50	5.00
108X182	99-10MM	10 mm	101.60 mm	5.50	5.00
108X184	99-11MM	11 mm	(4")	5.50	5.00

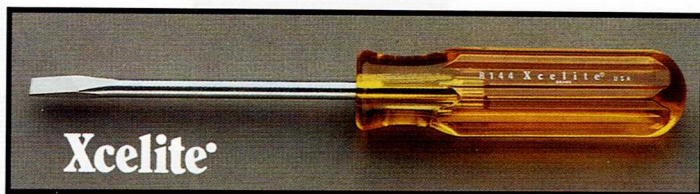
Reamer

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X210	99-38	1/8"-3/8"	4 1/4"	\$10.10	\$9.10

Extensions

Stock No.	Part No.	Description	Working Length	Prices	
				1-11	12-up
108X155	99-X-5	Adds 4"	4"	\$5.40	\$4.90
108X156	99-X-10	Adds 7"	7"	5.90	5.40





Slot Screwdrivers

Stock No.	Part No.	Blade Size	Overall Length	Prices	
				1-11	12-up
108X588	R-3322	2 x 3/32"	4 1/4"	\$2.15	\$1.95
108X590	R-3323	3 x 3/32"	5 1/4"	2.40	2.20
108X592	R-3324	4 x 3/32"	6 1/4"	2.55	2.30
108X556	R-181	2 x 1/8"	4 1/4"	2.10	1.90
108X558	R-182	2 x 1/8"	4 5/8"	2.55	2.30
108X560	R-183	3 x 1/8"	5 1/4"	2.55	2.30
108X562	R-184	4 x 1/8"	6 5/8"	3.30	3.00
108X564	R-186	6 x 1/8"	8 5/8"	3.60	3.25
108X566	R-188	8 x 1/8"	10 5/8"	3.85	3.50
108X572	R-1810	10 x 1/8"	12 5/8"	4.25	3.85
108X580	R-3163	3 x 3/16"	5 5/8"	4.15	3.75
108X582	R-3164	4 x 3/16"	6 5/8"	4.80	4.35
108X584	R-3166	6 x 3/16"	9 5/8"	5.20	4.70
108X586	R-3168	8 x 3/16"	11 5/8"	5.60	5.05
108X608	R-31610	10 x 3/16"	13 5/8"	6.45	5.80
108X550	R-144	4 x 1/4"	8 5/8"	5.50	4.95
108X552	R-146	6 x 1/4"	10 1/8"	6.15	5.55
108X554	R-148	8 x 1/4"	12 1/8"	6.70	6.05
108X570	R-1410	10 x 1/4"	14 1/8"	7.05	6.35
108X594	R-5164	4 x 5/16"	8 1/2"	6.55	5.90
108X596	R-5166	6 x 5/16"	10 1/2"	6.80	6.15
108X598	R-5168	8 x 5/16"	12 1/2"	7.50	6.75
108X568	R-388	8 x 3/8"	12 1/2"	8.95	8.05
108X650*	S-141	1 x 1/4"	2 3/4"	4.65	4.20

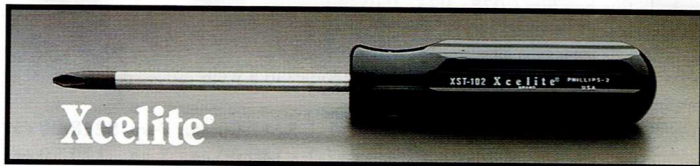
*Stubby, square blade screwdriver



Phillips Blade Screwdrivers

Stock No.	Part No.	Point Size	Blade Dia.	Blade Length	Overall Length	Prices	
						1-11	12-up
108X800	X-100	0	1/8"	2"	4 5/8"	\$3.15	\$2.85
108X801	X-101	1	3/16"	3"	6 3/8"	4.15	3.75
108X808	X-108	1	3/16"	6"	9 5/8"	5.45	4.90
108X802	X-102	2	1/4"	4"	8 3/8"	5.55	5.00
108X803	X-103	3	5/16"	6"	10 1/2"	7.70	6.95
108X810	X-1010	1	3/16"	10"	13 5/8"	7.05	6.35
108X812	X-1020	2	1/4"	10"	14 1/8"	7.95	7.15
108X721*	SX-102	2	1/4"	1 5/16"	3 5/8"	5.15	4.90

*Stubby, Phillips blade screwdriver



Super-Tru Tip Phillips

The bright, nickel chrome blades have tips which have been specially treated and finished with black oxide for the ultimate in control. The closer fit of these Super-Tru Tips allow for much longer wear and greatly reduces damage to screw heads, especially in smaller head fasteners.

Stock No.	Part No.	Point Size	Blade Dia.	Blade Length	Overall Length	Prices	
						1-11	12-up
108X910	XST-100	0	1/8"	2"	4 5/8"	\$3.95	\$3.55
108X911	XST-101	1	3/16"	3"	6 5/8"	5.45	4.90
108X913	XST-102	2	1/4"	4"	8 1/8"	6.95	6.25
108X915	XST-1010	1	3/16"	10"	13 5/8"	8.20	7.40
108X918	XST-1020	2	1/4"	10"	14 1/8"	9.20	8.30



PS-130 Screwdriver and Nutdriver Set

Compact five-piece screwdriver (#1, #2, 1/8", 3/16", 1/4") and five-piece nutdriver (3/16", 1/4", 5/16", 11/32", 3/8") set has color-coded handles. Includes black torque amplifier handle in a clear plastic carrying case with individual storage slots.

108X505PS-130
1-11, \$33.00 ea.
12-up, 30.00 ea.

PS-88 Screwdriver Set

Miniature eight-piece screwdriver set (#0, #1, #2, 3/32", 1/8", 5/32", 3/16", 1/4") has color-coded handles. The PS-88 comes with a black torque amplifier handle in a clear plastic carrying case with individual storage slots.

108X485PS-88
1-11, \$25.25 ea.
12-up, 22.75 ea.



SRX-33 Screwdriver Set

Contains two Phillips head and four slotted head screwdrivers.

108X710SRX-33
1-11, \$29.50 ea.
12-up, 26.50 ea.



SDR-11 Screwdriver Set

Contains five popular sized slot-type, round blade screwdrivers.

108X690SDR-11
1-11, \$21.75 ea.
12-up, 19.75 ea.



SDX-22 Screwdriver Set

Contains five commonly used Phillips regular-point screwdrivers.

108X696SDX-22
1-11, \$23.75 ea.
12-up, 21.50 ea.

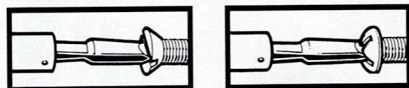


XST-5 Screwdriver Set

Contains all five Super-Tru Tip Phillips screwdrivers.

108X905XST-5
1-11, \$31.50 ea.
12-up, 28.50 ea.





Screwstarters

For many years, H.J.J. screwstarters have been a favorite of the industry, especially electronics. Their small size and ease of operation have made them popular with production people in every field. Each tool is round in shape and made of a durable brass metal. Choose from over 10 models.

For Slotted Screws

Stock No.	Part No.	Length	Screw Size	1-11	12-up
150X040	3-10	10"	#6, 8, 10	\$6.50	\$6.00
150X038	3-8	8"	#6, 8, 10	6.00	5.50
150X036	3-6	6"	#6, 8, 10	6.00	5.50
150X048	4-8	8"	#3, 4, 5	6.00	5.50
150X046	4-6	6"	#3, 4, 5	6.00	5.50

For Cross-Shaped Recess or Phillips Screws

Stock No.	Part No.	Length	Screw Size	1-11	12-up
150X041	3X-10	10"	#6, 8, 10, 12, 1/4	\$6.50	\$6.00
150X039	3X-8	8"	#6, 8, 10, 12, 1/4	6.00	5.50
150X037	3X-6	6"	#6, 8, 10, 12, 1/4	6.00	5.50
150X049	4X-8	8"	#3, 4, 5	6.00	5.50
150X047	4X-6	6"	#3, 4, 5	6.00	5.50

Skewdriver® Pro Kit

This is the professional kit for straight, stubby and offset screwdriving. Use heavy-duty Skewdriver Pro on hard-to-reach fasteners. Offset bit driver has interchangeable handle for manual or power-driven use in offset or normal locations. Unique gearing and die cast construction provide strength and durability. Positionable stabilizer is ideal for high-torque and restricted locations. Maximum performance is 100 inch-pounds torque and 400 rpm. The 1/4-inch hex shaft fits all 1/4-inch power screwdrivers. Create a standard bit driver with the 4 1/2-inch magnetic bit holder or a stubby driver with the 1 1/2-inch extension. Use head and extensions with power screwdrivers on offset, hard-to-reach and recessed fasteners. Includes 26 1/4-inch hex bits in spill-resistant, pocket-sized case. One-year warranty.

113X800 SPK4000(P) Skewdriver Pro Kit...1-11, \$49.00 ea.; 12-up, \$43.00 ea.



Picquic®

Picquic® Sixpac™ Six-in-One Screwdrivers

Patented, unique Picquics are premium-quality, six-in-one, multi-bit screwdrivers. Five-in-the-magazine bit-storage handles keep bits securely stored and ready for easy access. The most popular assortment of chrome vanadium slot, x-point and Torx® driver insert bits are included. Bit changing is easy. Simply remove unwanted bit from 1/4-inch hex-drive and use it to push desired bit through magazine-storage handle. The unwanted bit becomes securely stored, and the desired bit instantly snaps into the bit holder and is ready to use. This in-handle bit storage system offers triple benefits of visual bit selection, quick changes and never-lose-a-bit security.

Choose from two full-size configurations and a stubby size. The full-size 88101 and the stubby-size 91102 both have the same complement of bits (3/16", 1/4", #1, #2, #3 and T15). The full-size 90111 Torx® version has 1/4", #1, T15, T20, T25 and T30 sizes. Designed to the highest mechanical standards, these screwdrivers come with a lifetime defect-free warranty.

224X060	88101 Full-Size Picquic	.....1-11, \$15.95 ea.; 12-up, \$14.25 ea.
224X200	91102 Stubby-Size Picquic	.....1-11 12.95 ea.; 12-up, 11.50 ea.
224X111	90111 Full-Size Torx®	.....1-11, 16.95 ea.; 12-up, 15.25 ea.



English/Metric Screwdriver Kit

A. 7331: Popular set is designed for speedy, one-hand selection of parts. Packaged in a yellow polyethylene case with each item secured in its own compartment. Includes all the 4320 parts below plus six metric Allen bits (1.5-5 mm).

Model 7331 English/Metric Screwdriver Kit
022X7331-9, \$28.00 ea.; 10-up, \$26.00 ea.

Ratchet Screwdriver Kit

B. 4320: A variety of the most often used adapters are organized in a durable, plastic case. This fine screwdriver set contains ratchet, extension, screwdriver handle, 12 Allen hex adapters .050"-5/16", two slot screwdriver adapters, two Phillips head adapters and 1/4" square drive adapter.

Model 4320 Ratchet Screwdriver Kit
022X632.....1-9, \$24.00 ea.; 10-up, \$22.00 ea.

Midget Ratchet Tool Kit

C. 1316: This economy-priced, extremely popular soft-pack kit contains a Chapman ratchet plus 15 of the most often used adapters. You get 10 Allen hex type adapters (.050", 1/16", 5/64", 3/32", 1/8", 5/32", 3/16", 7/32", 1/4" and 5/16" distance across flats), two slotted head adapters (1/4" and 3/8" blade widths), two Phillips head adapters (No. 1 and No. 2) plus 1/4" square drive adapter. Box sockets not supplied.

022X316 1316 Midget Ratchet Kit.....1-9, \$16.00 ea.; 10-up, \$14.75 ea.

Torque Screwdrivers/Kits

Torque limiting screwdrivers offer the most reliable means of tightening small threaded fasteners. When set torque is reached, screwdriver goes into freewheeling condition, preventing further torquing. Control mechanism engages and disengages eight times during each handle revolution in either right or left hand direction. Adjustable models have calibrated micrometer scales.

Kit #1 Range 2-100 Inch/Ounces: Includes TS-100 Torque screwdriver that measures 2-100 inch/ounces in 2-inch/ounce increments. Accessories include five hex bits (.028, .035, .050, 1/16, 5/64), four sockets (3/32, 7/64, 1/8, 3/16), four slot screwdriver bits, two Phillips screwdriver bits, 1/4" drive adapter and miniature bit holder. Comes in a well-organized plastic case.

098X825 Kit #1.....1-2, \$237.00 ea.; 3-up, \$218.00 ea.
099X308 TS-100 Tool Only.....1-2, 140.00 ea.; 3-up, 129.50 ea.

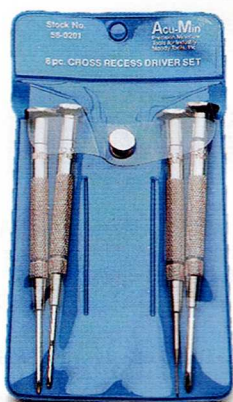
Kit #2 Range 1-30 Inch/Pounds: Includes TS-30 torque screwdriver that measures 1-30 inch/pounds in 1-inch/pound increments. Accessories include seven hex bits (.035, .050, 1/16, 5/64, 3/32, 1/8, 5/32), five sockets (7/64, 1/8, 3/16, 1/4, 5/16), five slot screwdriver bits, two Phillips screwdriver bits, 1/4" drive adapter and miniature bit holder. Comes in a well-organized plastic case.

098X827 Kit #21-2, \$252.00 ea.; 3-up, \$232.00 ea.
099X305 TS-30 Tool Only.....1-2, 140.00 ea.; 3-up, 129.50 ea.

Kit #3 Range 2 Inch/Ounces-30 Inch/Pounds: Our most complete kit incorporates both TS-100 and TS-30. It includes all the accessories found in both kits above, plus 13 of the most often used bits have been doubled so you have a ready spare or can utilize both screwdrivers at once.

098X829 Kit #31-2, \$440.00 ea.; 3-up, \$399.00 ea.





Phillips Screwdriver Set

Four Swivertop handles and two each interchangeable blades. Sizes #000 pt., #00 pt., #0 pt. and #1 pt.

070X20058-0201
1-9, \$16.25 ea.
10-up, 14.70 ea.



Screwdriver Set #2

Six Swivertop handles and one each interchangeable blades. Sizes .025" through .100" blades.

070X11658-0116
1-9, \$16.50 ea.
10-up, 15.00 ea.

Moody

Sub Miniature Tool Sets

The Super Deluxe Miniature Tool Set includes 27 Swivertop handles, two each of six different sizes of slot screwdriver blades, two each of two different sizes of Phillips screwdriver blades, two each of six different Hex blade sizes from .028" to .093", two each of five different nutdriver blades from 5/64" to 3/32", two each of eight open-end wrenches from 5/64" to 3/16" and a 3" extension. The Super Standard Set includes all the above except only one of each blade. The Super Basic Set includes all 27 blades listed above but only one Swivertop handle.



Stock No.	Part No.	Description	Prices	
			1-5	6-up
070X152	58-0152	Super Deluxe Set	\$98.00	\$88.00
070X153	58-0153	Super Standard Set	69.00	62.00
070X154	58-0154	Super Basic Set	28.00	25.00



STANLEY

Ratchet Screwdriver Set

Exclusively from Stanley, this 26-piece ratcheting screwdriver set has become a favorite since its introduction a short while ago. It features three slot-type screwdriver bits (3/16", 1/4" and 5/32"), two Phillips-type bits (#1 and #2), five Torx bits (T10, T15, T20, T25 and T30), 1/4" drive socket adapter, seven SAE 1/4" drive sockets (3/16", 1/4", 5/16", 11/32", 3/8", 7/16" and 1/2"), seven metric 1/4" drive sockets (6 mm, 7 mm, 8 mm, 9 mm, 10 mm, 11 mm and 12 mm) plus three-position (Forward-Lock-Reverse) ratchet tool. This ratchet is designed to be comfortable and functional with storage in the head for up to six bits. All sockets and ratchet tool are chrome plated. Screwdriver/Torx bits are treated with black oxide for maximum wear and long life. Ratcheting tool and all 25 accessories are supplied in an attractive, useful carrying case that opens from the top for easy accessibility.

087X650 68-754 Ratchet Screwdriver Set..1-5, \$34.00 ea.; 6-up, \$31.25 ea.

VERMONT AMERICAN



Magnetic Tip Screwdrivers

These magnetic screwdrivers are actually many screwdrivers in one. By utilizing interchangeable bits that are held securely in place by a strong magnet at the tip of the shank, these tools often eliminate the need to carry a selection of screwdrivers at all times. When not in use, the bits fit conveniently in the handle of the tool. Each of these magnetic screwdrivers features an all-aluminum magnetic shank with a forged head that resists rust and provides extra strength for the toughest of jobs. That combined with the comfortable, contour-shaped handle and the hardened-steel bits ensure that these tools will last on the job. Choose from two sets.

15511 Standard Screwdriver — Our best seller. This tool is supplied with four interchangeable bits: two slotted-type (3-4 and 6-8) plus two Phillips-type (#1 and #2). Overall length is 7.25".

100X797 #15511 Mag. Screwdriver Set...1-11, \$10.00 ea.; 12-up, \$9.00 ea.

15516 Torx Driver Set — A handy tool kit addition. This tool is supplied with five interchangeable Torx bits, (T10, T15, T20, T25 and T30). Overall length is 7.25".

100X798 #15516 Magnetic Torx Set1-11, \$14.50 ea.; 12-up, \$13.05 ea.



Ratcheting Offset Screwdrivers

These are very useful tools for accessing hard-to-reach screws or when working in tight places. Each of these tools is only 4" long and features a two-position ratchet (Forward-Reverse). The tools are made of a plated steel with blades that are made of machine-ground and hardened tool steel for maximum durability. Choose from three models.

A. 807 Slot — Ratcheting offset screwdriver features two slot blades (1/4" and 3/8").

046X807 Model 807 Double Slot Blade1-11, \$5.75 ea.; 12-up, \$5.20 ea.

B. 807X Phillips — Ratcheting offset screwdriver features two Phillips blades (#1 and #2).

046X808 Model 807-X Dbl. Phil. Blade1-11, \$7.75 ea.; 12-up, \$7.00 ea.

C. 807SX Combo — Ratcheting offset screwdriver features one slot (1/4") and one Phillips (#2) blade.

046X809 Model 807-SX Combo Blade1-11, \$7.25 ea.; 12-up, \$6.55 ea.

Standard Offset Screwdrivers

Designed for working in hard-to-reach places, these tools are often the only way to drive or loosen fasteners in cramped places. Made of forged steel, offset screwdrivers feature 90° angulated blades. Choose from two styles.

D. P-120 Phillips — Features a round shaft with both #1 and #2 Phillips points. Overall length is 4".

060X804 Model P120 Offset Phillips1-11, \$3.00 ea.; 12-up, \$2.75 ea.

E. V-01 Slot — Features a hex shaped shaft with 3/16" slot blades (.030" thick). Overall length is 3".

060X800 Model V01 Offset Slot.....1-11, \$4.00 ea.; 12-up, \$3.75 ea.





Precision Electronics Tool Sets

Wiha makes precision electronics tool sets with hardened, plated steel blades for long life. They feature precision-machined black oxide tips for exact fit, comfortable tapered handles for rapid rotation and fingertip rotation cups for added control. Reusable plastic pouches weigh 1/2 pound or less including tools. Lifetime warranty.

Slotted/Phillips Screwdriver Set — Seven-piece set includes three Phillips drivers (00, 0 and 1) plus four slotted drivers (1.5, 2.0, 2.5 and 3.0 mm). Tools range in length from 4 3/4" to 6 1/2" and come in a box.

175X998 26190 Screwdriver Set.....1-11, \$29.50 ea.; 12-up, \$27.00 ea.



Nutdriver Sets — Set of eight nutdrivers includes 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32 and 1/4". Eight-piece metric set includes 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5 and 6.0 mm. Tools range in length from 6" to 6 5/8".

175X152 26591 Nutdriver (English)...1-11, \$58.50 ea.; 12-up, \$53.00 ea.

175X150 26590 Nutdriver (Metric)...1-11, 59.00 ea.; 12-up, 53.50 ea.



Hexdriver Sets — Eight-piece hexdriver set includes .028, .035, .050, 1/16, 5/64, 3/32, 7/64 and 1/8". Seven-piece metric set includes .71, .89, 1.27, 1.5, 2.0, 2.5 and 3.0 mm. They range in length from 4 1/2" to 6 5/8".

175X102 26391 Hexdriver (English)...1-11, \$33.00 ea.; 12-up, \$30.00 ea.

175X100 26390 Hexdriver (Metric)...1-11, 29.50 ea.; 12-up, 27.00 ea.



Torx® Set — Six-piece Torx set includes T6, T7, T8, T9, T10 and T15 ranging in length from 4 5/8" to 6 5/8".

175X999 26790 Torx Set.....1-11, \$36.00 ea.; 12-up, \$32.50 ea.



Deluxe Screwdriver Set

The Deluxe Screwdriver Set contains a handle with 10 interchangeable drivers. It includes three slotted drivers (1.5/3, 2.0/3.5, 2.5/4.0 mm), two Phillips drivers (000/00, 0/1) and five ballpoint hex drivers (1.3, 1.5, 2.0, 2.5, 3.0 mm). The handle with this tool is 6 5/8". The Small Set contains three slotted and Phillips drivers (2, 3 and 4 mm).

175X200 26992 Deluxe SD Set.....1-11, \$82.50 ea.; 12-up, \$74.50 ea.

175X190 26990 Small SD Set.....1-11, 31.00 ea.; 12-up, 28.00 ea.



Multi-Bit Driver

Insulated Magnetic Holder made of cellulose acetate features the Wiha Powerhandle™ grip. Chrome-vanadium-molybdenum steel blades. The 1/4" hex drive accommodates the six-bit set. Includes three slotted bits (3/16" x 1", 1/4" x 1", 5/16" x 1") and three Phillips bits (#1 x 1", #2 x 1", #3 x 1"). The holder is 9 inches long.

175X400 38006 Multi-Bit Driver.....1-11, \$18.50 ea.; 12-up, \$16.50 ea.

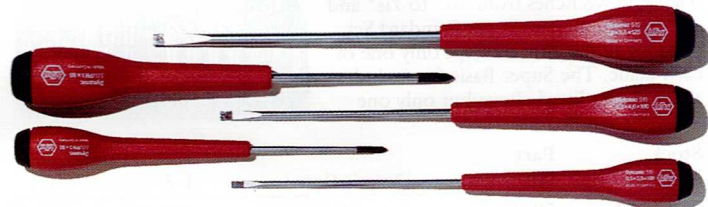


Insulated Blade Screwdriver Set

The 32092 is a six-piece screwdriver set with blades insulated to withstand up to 1 kV ac. Special palm-fit handles are comfortable and provide sure-grip for better torque transfer. Precision-machined tips give close-tolerance fit and minimal fastener damage.

This 1.5-pound set contains three slot screwdrivers (9/64" x 3.5", 3/16" x 4.5" and 1/4" x 6.5") plus three x-point screwdrivers (#1 x 3", #2 x 3.5" and #3 x 6.5") drivers. Limited lifetime warranty.

175X210 32092 Insulated Driver Set....1-11, \$39.00 ea.; 12-up, \$36.00 ea.



Dynamic Screwdriver Set

The five-piece 51090 Dynamic Screwdriver Set features a unique handle design with a built-in black spinner top. This gives a more positive grip in the palm of the hand while allowing the fingertips to rotate the screwdriver easily in either direction. Greatly reduce hand fatigue while driving long or large quantities of fasteners.

This .75-pound tool set contains three slot screwdrivers (1/8" x 4", 3/16" x 4" and 1/4" x 5") plus two x-point screwdrivers (#0 x 2" and #1 x 3"). Limited lifetime warranty.

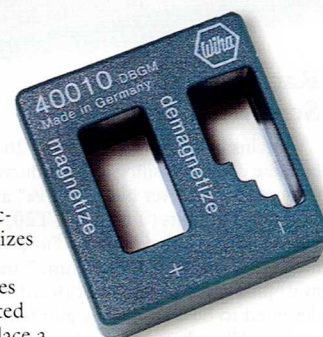
175X435 51090 Dynamic Driver Set....1-11, \$32.00 ea.; 12-up, \$29.00 ea.

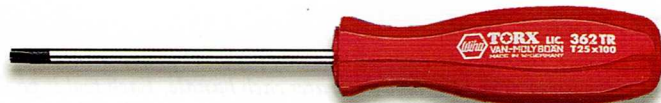
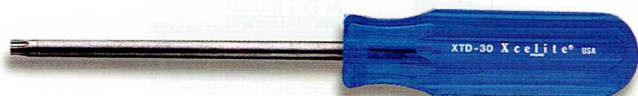
Magnetizer/Demagnetizer

Instantly magnetize or demagnetize tools and small parts on the job. Magnetizing allows for easy, precise, one-handed positioning in confined spaces. Tools easily retrieve metal items from inaccessible places. The 40010 also demagnetizes instruments for use in electronics.

A powerful permanent magnet provides extended life. The shatterproof, dual-slotted box is made from durable ABS plastics. Place a tool in the positive (+) slot to magnetize it or in the negative (-) slot to demagnetize it. The 40010 weighs .25 pounds and measures 2.1" x 2" x 1.1". Lifetime warranty.

175X414 40010 Magnetizer.....1-11, \$8.50 ea.; 12-up, \$7.65 ea.





Torx Drivers

The Torx Driver is a 6-point fastening tool which maximizes the driving surface for longer drive life while maximizing torque, reducing slippage and minimizing worker fatigue. Sometimes called the "Star" fastener because of its likeness to the shape of a star, this fastening system is used on most late model cars as well as appliances, televisions and computers.

Stock No.	Part No.	Torx Size	Blade Length	Overall Length	Prices	
					1-11	12-up
108X926	XTD-6	T6	3"	6½"	\$5.25	\$4.70
108X928	XTD-8	T8	3"	6½"	5.25	4.70
108X930	XTD-10	T10	3"	6½"	5.25	4.70
108X932	XTD-15	T15	3"	6½"	5.25	4.70
108X934	XTD-20	T20	3"	6½"	5.25	4.70
108X936	XTD-25	T25	3"	6½"	5.25	4.70
108X938	XTD-27	T27	4½"	8½"	6.00	5.40
108X940	XTD-30	T30	4½"	8½"	6.00	5.40



Tamper-Proof Torx® Screwdrivers

These precision-machined recessed-star screwdrivers feature holes drilled in the ends to accommodate Tamper-Proof Torx® fasteners. Each comfortable red handle is clearly marked with the Torx® size. The TPT-5 is a deluxe five-piece set of the most popular Tamper-Proof Torx® Screwdrivers in sizes TR10-TR27. Individual sizes also may be purchased separately. Lifetime defect-free warranty.

175X005 TPT-5 Torx® Set1-11, \$36.00 ea.; 12-up, \$32.50 ea.

Stock No.	Part No.	Torx Size	Blade Length	Overall Length	Prices	
					1-11	12-up
175X226	36226	TR10	3"	6"	\$6.50	\$5.85
175X231	36231	TR15	3"	6.3"	6.70	6.00
175X236	36236	TR20	4"	7.3"	8.40	7.50
175X241	36241	TR25	4"	7.5"	8.50	7.75
175X246	36246	TR27	4.5"	8"	10.00	9.00



13532 Ballpoint Star-Recessed Torx® Driver Set

The new Bondhus 13532 Ballpoint Torx® Screwdriver Set provides fast 0- to 20-degree entry and operation. It includes eight popular star-recessed type drivers: T9, T10, T15, T20, T25, T27, T30 and T40. Each comfortable ribbed green handle is plainly marked with the Torx® size. The proven ballpoint design makes it easy and fast to use even when there is inadequate clearance for normal straight-on screwdriving. Lifetime defect-free warranty.

175X085 13532 Ballpoint Driver Set1-11, \$44.50 ea.; 12-up, \$40.00 ea.

36292 Deluxe Torx® Set



The eight-piece 36292 is a deluxe set of the popular standard powerhandle Torx® driver sizes T6-T30. You get T6 x 50 mm, T8 x 60 mm, T10 x 80 mm, T15 x 80 mm, T20 x 100 mm, T25 x 100 mm, T27 x 115 mm and T30 x 115 mm. Each comfortable red handle is clearly marked with the Torx® size. These precision-machined, recessed-star drivers give maximum torque as well as minimize worker fatigue and fastener damage. Lifetime defect-free warranty.

175X260 36292 Deluxe Torx® Set1-11, \$39.00 ea.; 12-up, \$35.50 ea.

SqueezeDriver

High-Speed Precision Screwdriver

Reversible-drive SqueezeDriver is actually three fast-action hand tools in one. It's a high-speed precision screwdriver, a powerful ratchet driver with auto-selectable torque and a light-duty drill. The powerful SqueezeDriver works fast without electricity or air and provides precision hand control.

The forward squeeze zone provides high torque and control of 30-45 inch-pounds. The rear squeeze zone is for high-speed driving of 200 rpm (10-15 inch-pounds). Each squeeze begins with high torque of 35 inch-pounds. The drive shifts automatically to high (200 rpm) for fast, easy driving. Tough, leveraged ratchet action generates up to 140 inch-pounds of torque to break tight screws free. Direct hand control prevents stripped threads and holes. SqueezeDriver's 200-rpm average speed beats many cordless drivers. It can attain a maximum rpm in excess of 350. Ratchet and squeeze driving may be used interchangeably or simultaneously.

Model 00118 SqueezeDriver has a yellow high-impact ABS housing. It accepts standard ¼" power hex bits. This 15-ounce unit measures 7.75" x 6.5" x 1.5". Order the SDIK108 SqueezeDriver Installer's Kit to get the lightweight, variable torque, basic driver with P2/#8 flip bit, P1 x-point bit, #5-6 slot bit, ¼" and ⅜" drill bits, ⅜" and ⅞" nutdrivers and leather holster. The 14200 Lockbit 14-Piece Power Driver Conversion Kit includes a ¼-inch lockbit and 13 high-speed steel drill bits (⅜" to ⅞"). Order the 12300 for a 12-Piece Drive Bit Set. The 00200 Lockbit ¼" Keyless Drill Chuck and the 10200 Lockbit ⅜" Keyless Drill Chuck accept conventional round drill bits. Unconditional one-year warranty on SqueezeDriver.

374X111	00118 SqueezeDriver.....	1-11, \$24.00 ea.; 12-up, \$22.75 ea.
374X800	SDIK108 Driver Kit.....	1-11, 64.00 ea.; 12-up, 61.00 ea.
374X300	12300 12-Piece Drive Bit Set.....	8.00 ea.
374X200	00200 Lockbit ¼" Keyless Drill Chuck.....	6.00 ea.
374X255	10200 Lockbit ⅜" Keyless Drill Chuck.....	5.50 ea.



WorkTools



SPC Pocket Tools

Compact, lightweight tools with handy pocket clips are inexpensive and convenient. The SPC logo decorates each handle. Each tool is packaged in a blue plastic sleeve that's transparent on one side. Choose from an array of nine pocket tools in assorted colors.

A. Pocket File: Use this burnisher to clean general-purpose contacts. The 3" flexible file with black handle is 3.75" long in its white case and 6" long with extended handle. Not clip on.

083X370 D-3701-24, \$3.60 ea.; 25-up, \$3.25 ea.

B. Screwdriver with Dip Switch: This screwdriver has a dip switch depressor on the other end. It features a top-quality, heat-treated and tempered nickel-plated steel blade. The 5.75" tool has a metallic gray barrel and black logo.

083X400 D-400R/DS1-24, \$2.25 ea.; 25-up, \$2.00 ea.

C. Screwdriver with Lift-Off: A sturdy lift off device on the top of this screwdriver will come in handy in many situations. Top-quality, heat-treated and tempered nickel-plated steel blade. The 6" tool has a yellow barrel with red logo.

083X404 D-400R/LO1-24, \$3.25 ea.; 25-up, \$2.90 ea.

D. Screwdriver with Phillips: Two screwdrivers in one tool give you a choice of standard and #0 Phillips head ends. It features a top-quality, heat-treated and tempered nickel-plated steel blade. D-400R/PH is 5.75" long and has an orange barrel with black logo.

083X405 D-400R/PH1-24, \$2.25 ea.; 25-up, \$2.00 ea.

E. Level Screwdriver with Magnet: The addition of two extra features make this screwdriver twice as popular. Its blade and top are magnetized with a level conveniently placed in between them. D0407R/M features a top-quality, heat-treated and tempered nickel-plated steel blade. This 5.5" tool has a transparent blue barrel and white logo.

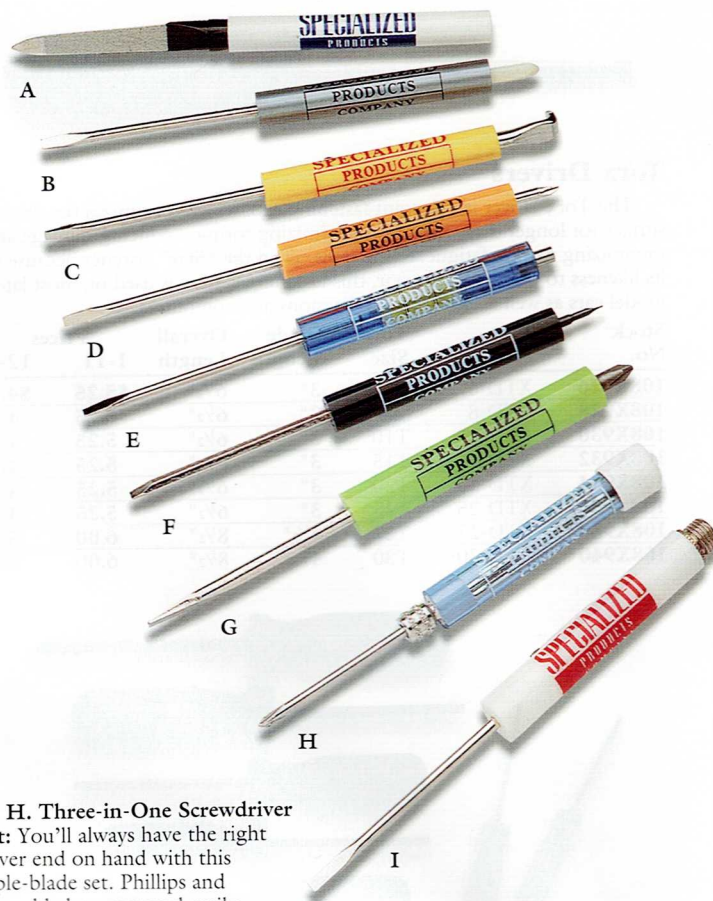
083X407 D-407R/M1-24, \$5.25 ea.; 25-up, \$4.75 ea.

F. Reversible Screwdriver: A two-ended model, the D-437 is ideal for repairing items with both standard size and micro screws. Its black anodized jeweler's blade top features a special tapered head for easier use with its own safety cap. This 5.7" dual-purpose tool features a black barrel with white logo.

083X418 D-4371-24, \$7.00 ea.; 25-up, \$6.30 ea.

G. Mr. Torque™ Screwdriver with Phillips: Use your choice of 3/16" screwdriver blade and 3/16" #1 Phillips blade. This combination provides the power to handle any job. Mr. Torque is 6" long with a green barrel and black logo.

083X425 D-515R/PH1-24, \$4.25 ea.; 25-up, \$3.80 ea.



H. Three-in-One Screwdriver

Kit: You'll always have the right driver end on hand with this triple-blade set. Phillips and micro blades are stored easily inside the handle. Model D-731 is 5" long with a blade installed in the transparent blue barrel with white logo.

083X431 D-7311-24, \$5.00 ea.; 25-up, \$4.50 ea.

I. Knife-Driver™: A handy pocket knife is combined with a reliable screwdriver. The durable knife blade unscrews and reverses for safe storage in the screwdriver handle. This tool is 6.9" long with the knife screwed into the white barrel with a red logo and red end cap.

083X455 D-7551-24, \$7.50 ea.; 25-up, \$6.75 ea.

StickDriver 4.1

Four-in-One Driver

StickDriver 4.1 is a uniquely clever little tool. The segments of this popular driver pull apart to reveal four different drive tips. Its back cover is removable so all the segments can be pulled apart and reassembled. The useful bit selection includes 0 and 1 Phillips plus 3 and 4.5 slotted, making it ideal for electronics applications.

374X850 StickDriver 4.11-24, \$4.95 ea.; 25-up, \$4.25 ea.

Precision Ceramic Screwdrivers

- Antistatic, antimagnetic ceramic blades
- Cadmium-free, antistatic, tapered plastic handles

Wiha Precision Ceramic Screwdrivers are completely antistatic. Special ceramic blades feature high thermic and electric insulation. They are antistatic and antimagnetic for correct adjusting in high-frequency areas. Black, high-quality plastic Wiha-slender handles are antistatic and cadmium free. They are comfortably tapered for rapid rotation at lower torque. The rotating cups on handle ends facilitate adjusting and holding of tools for precision control.

Choose from four slotted screwdrivers and one Phillips screwdriver. Model 27009 slotted blade is 0.9 mm (.035") in diameter and 15 mm (.591") long. This screwdriver measures 94.5 mm (3.72") long. Model 27013 slotted blade is 1.3 mm (.051") in diameter and 15 mm (.591") long. This tool measures 94.5 mm (3.72") long. Model 27018 slotted blade is 1.8 mm (.071") in diameter and 15 mm (.591") long. The screwdriver measures 94.5 mm (3.72") long. Model 27026 slotted blade is 2.6 mm (.102") in diameter and 15 mm (.591") long. This tool is 94.5 mm (3.72") long. Model 27100 Phillips screwdriver blade is size 0 and



15.0 mm (.591") long. This tool is 94.5 mm (3.72") long. Defect-free warranty on materials and workmanship upon delivery only.

175X202 Model 27009 Slotted1-9, \$15.70 ea.; 10-up, \$14.25 ea.

175X203 Model 27013 Slotted1-9, 15.70 ea.; 10-up, 14.25 ea.

175X204 Model 27018 Slotted1-9, 15.70 ea.; 10-up, 14.25 ea.

175X205 Model 27026 Slotted1-9, 15.70 ea.; 10-up, 14.25 ea.

175X207 Model 27100 Phillips1-9, 15.70 ea.; 10-up, 14.25 ea.





177 Nutdriver Set

Contains seven pieces, all hollow shaft nos. HS6, HS8, HS10, HS11, HS12, HS14 and HS16.

108X282 177
1-11, \$37.50 ea.
12-up, 34.00 ea.



Nutdriver Set HS-6-18 "Keep & Carry" Case

Sturdy plastic stand-up case with slip-over cover keeps nutdrivers orderly on workbench, carries them on service calls. Contains hollow shaft nos. HS6, HS7, HS8, HS9, HS10, HS11, HS12, HS14, HS16 and HS18.

108X332 HS-6-18
1-11, \$54.00 ea.
12-up, 48.50 ea.



Miniature Standard Nutdriver Set Model PS-120

Miniature compact standard nutdriver set includes 10 drivers $\frac{3}{32}$ "- $\frac{3}{8}$ " and a slip-on torque handle. Each driver measures $3\frac{1}{2}$ " long, overall. Attractively packaged in a handy, clear plastic case.

108X500 PS-120 Set
1-11, \$32.00 ea.
12-up, 29.00 ea.



Miniature Metric Nutdriver Set Model PS-121 mm

Miniature compact metric nutdriver set includes 10 drivers 3 mm-10 mm and a slip-on torque handle. Each driver measures 89 mm long, overall. Attractively packaged in a handy, clear plastic case.

108X502 PS-121 mm Set
1-11, \$39.50 ea.
12-up, 35.50 ea.



Full Hollow Shaft Nutdrivers

Stock No.	Part No.	Color Code	Hex Opening	Prices	
				1-11	12-up
108X320	HS-6	Black	$\frac{3}{16}$ "	\$5.25	\$4.75
108X321	HS-7	Brown	$\frac{7}{32}$ "	5.25	4.75
108X322	HS-8	Red	$\frac{1}{4}$ "	5.25	4.75
108X323	HS-9	Orange	$\frac{9}{32}$ "	5.25	4.75
108X324	HS-10	Amber	$\frac{5}{16}$ "	5.25	4.75
108X325	HS-11	Green	$\frac{11}{32}$ "	5.75	5.25
108X326	HS-12	Blue	$\frac{3}{8}$ "	5.75	5.25
108X327	HS-14	Brown	$\frac{7}{16}$ "	7.25	6.50
108X328	HS-16	Red	$\frac{1}{2}$ "	7.25	6.50
108X329	HS-18	Orange	$\frac{9}{16}$ "	7.25	6.50



Metric Nutdriver Set 4-13 mm "Keep & Carry" Case

Sturdy plastic stand-up case with slip-over cover keeps nutdrivers orderly on workbench or on service calls. Contains all sizes of metric nutdrivers listed below (4 mm-13 mm). Ten pieces total.

108X002 4-13 mm Set 1-11, \$55.50 ea.; 12-up, \$50.00 ea.



Long Hollow Shaft Nutdrivers

Stock No.	Part No.	Hex Opening	Shaft Length	Prices	
				1-11	12-up
108X338	L-6	$\frac{3}{16}$ "	6"	\$6.50	\$6.00
108X340	L-8	$\frac{1}{4}$ "	6"	6.50	6.00
108X345	L-8M*	$\frac{1}{4}$ "	6"	9.50	8.50
108X346	L-10	$\frac{5}{16}$ "	6"	6.50	6.00
108X347	L-10M*	$\frac{5}{16}$ "	6"	9.50	8.50
108X348	L-11	$\frac{11}{32}$ "	6"	7.00	6.30
108X349	L-12	$\frac{3}{8}$ "	6"	7.00	6.30

*Includes permanent magnet inserted in socket.



Metric Nutdrivers

Stock No.	Part No.	Hex Opening (MM)	Prices	
			1-11	12-up
108X001	4-mm	4	\$5.25	\$4.50
108X003	4.5-mm	4.5	5.25	4.50
108X004	5-mm	5	5.25	4.50
108X005	5.5-mm	5.5	5.25	4.50
108X007	6-mm	6	5.25	4.50
108X009	7-mm	7	5.25	4.50
108X012	8-mm	8	5.25	4.50
108X015	9-mm	9	6.50	5.50
108X018	10-mm	10	6.50	5.50
108X021	11-mm	11	6.50	5.50





Balldriver® L-Wrench Sets

Bondhus Balldriver hex tools have long been recognized as the world's finest precision hex tools. Their unique ball-type construction allows operation from almost any angle, making your job faster and easier. Each Bondhus hex tool is made from highest quality 8650 tool steel, cold drawn to precise specifications and heat treated for optimum hardness and to eliminate shattering. These compact Balldriver® L-wrench sets are ideal where a variety of tool sizes is required. Each set is packaged in a patented Bondhex™ key case that allows the L-wrenches to slip easily into individually marked slots.

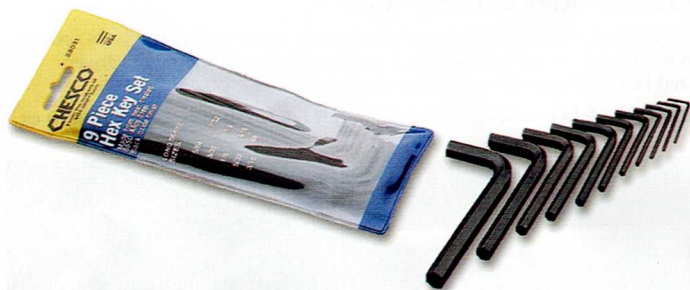
Stock No.	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
175X930	10945	8	5/64"-3/16"	\$ 8.00	\$ 7.25
175X927	10937	13	.050"-3/8"	18.75	17.00
175X935	10946	6	1.5-5 mm	7.00	6.25
175X990	10999	9	1.5-10 mm	15.50	14.00



Spline Socket Key Sets

These spline socket key sets are made of alloy steel with a black finish. Choose from short-armed (SS-508) and long-armed (SL-607) sets that come packaged in handy plastic pouches.

Stock No.	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
512X508	SS-508	9	.033"-4".111"	\$10.00	\$ 9.00
512X607	SL-607	7	.096"-2.216"	16.00	14.50



Standard Hex Key Sets

Each hex key set contains high-quality internal wrenching tools manufactured from high-quality 8650 alloy steel. They are precision drawn to the closest tolerances to ensure an accurate fit into socket screws. A strict SPC quality control system and in-house heat treating ensure that each key is within specification, properly heat treated and free of excessive decarburization for longer tool life and retention of dimensional accuracy.

Choose from short-armed (88021 and 88026) and long-armed (88031) L-kits. A short-armed metric L-key set (88060) is also available.

Stock No.	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
023X160	56100	6	.028"-3/32"	\$2.75	\$2.50
023X175	56032	15	.028"-3/8"	7.50	6.75
023X200	88031	9	5/64"-3/8"	5.00	4.50
023X235	88060	7	2-8 mm	5.50	5.00



Standard L-Wrench Sets

These specially designed hex keys from Bondhus are identical to their world-famous Balldriver® keys described a left except they are standard-end tools (no ball ends). Each key is chamfer milled to eliminate cut-off burr problems often found on other common hex keys exceeding the allowed clearance between the screw and the key and interfering with socket engagement. Each of these sets is packaged in a patented Bondhex™ plastic key case, allowing the hex keys to slip easily in and out of individually marked slots. Choose from four sets.

Stock Number	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
175X992	12145	7	5/64"-3/16"	\$ 6.50	\$ 5.75
175X991	12136	12	.050"-3/16"	14.00	12.50
175X993	12146	6	1.5-5 mm	5.50	5.00
175X995	12199	9	1.5-10 mm	15.00	13.50

Balldriver® Hex Driver Sets

Balldriver® hex drivers make standard hex tools obsolete. Handles and blade lengths are proportioned to allow optimum torque. Handles for metric, and inch sizes are color coded and stamped with size for easy identification. The 10645 and 10686 are packaged in convenient clear plastic pouches, and the 10637 and 10699 come in deluxe molded plastic holders for easy storage.



Stock No.	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
175X730	10645	8	5/64"-3/16"	\$17.25	\$15.50
175X725	10637	13	.050"-3/8"	42.00	37.75
175X775	10686	6	1.5-5 mm	15.00	13.50
175X780	10699	9	1.5-10 mm	33.00	30.00

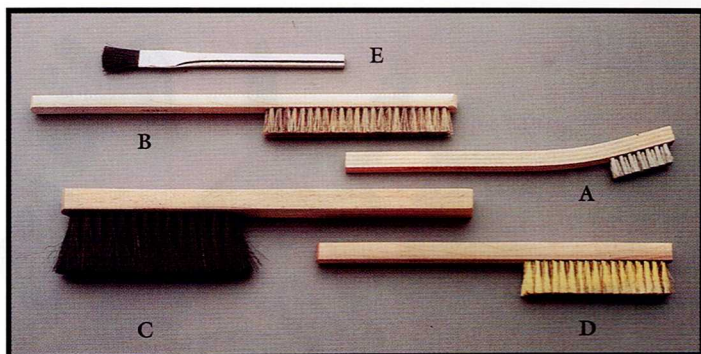


T-Handle Balldriver® Hex Tool Sets

Balldriver® T-Handle tools are industrial strength in every way. They feature welded steel handles with cushion grips sized for maximum torque while protecting ballpoint and screw from rounding or stripping. Each tool provides long reach with its 8650 steel blade. Choose inch or metric sets or the double pack set. Sizes are clearly marked on each color-coded handle. Lifetime warranty.

Stock No.	Part No.	Tools per Set	Individual Sizes	Prices	
				1-11	12-up
175X046	13146	6	5/32", 3/16", 7/32", 1/4", 5/16", 3/8"	\$39.50	\$35.50
175X045	13138	10	3/32"*, 7/64"*, 1/8"*, 9/64"*, 5/32", 3/16", 7/32", 1/4", 5/16", 3/8"	53.50	48.00
175X048	13148	5	4, 5, 6, 8, 10 mm	34.00	30.50
175X053	13187	7	2.5*, 3*, 4, 5, 6, 8, 10 mm	41.00	37.00
175X056	13199	11	5/32", 3/16", 7/32", 1/4", 5/16", 3/8", *Straight hex only	66.00	59.50





Brushes

A. Stainless Steel Brush: For cleaning corrosion from parts without scratching. Brush measures .38" x 1.38" with a 7" handle.

083X315 #15 Brush.....1-24, \$3.75 ea.; 25-up, \$2.95 ea.

B. Parts Cleaning Brush: Ideal for cleaning PC boards. Made of medium soft fibers. Brush measures .63" x 4.25" with a 10" wood handle.

048X550 16.112-1 Brush.....1-24, \$6.50 ea.; 25-up, \$5.40 ea.

C. Bench Brush: Great for cleaning up work areas and assembly benches. Brush measures 1.38" x 4" with a 9.5" wood handle. Soft bristles.

048X530 16.051-1 Brush.....1-24, \$7.00 ea.; 25-up, \$6.00 ea.

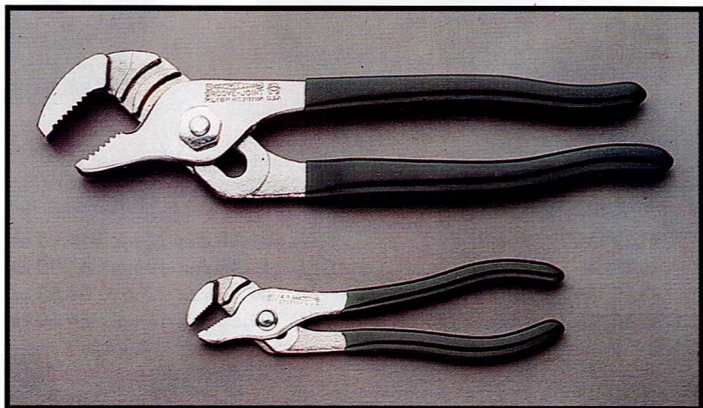
D. Brass Brush: Highly abrasive. Brush measures .75" x 4.5" with a 8.25" wood handle.

048X570 16.310-1 Brush.....1-24, \$6.50 ea.; 25-up, \$5.85 ea.

E. Acid Brush: Heavy-duty industrial-quality brush for applying flux or solvents. Available individually or by the box (gross). Measures 6" x .38".

083X149 AB-5-1 Industrial Brush.....1-24, \$.30 ea.; 25-up, \$.25 ea.

083X150 AB-5 Brushes (Box/144).....1-9, 18.00 ea.; 10-up, 15.50 ea.



"Groove Joint" Utility Pliers

Diamond groove joint pliers utilize an innovative "undercut" locking design that gives these pliers unsurpassed strength and precision at all variations of jaw openings. They are forged from special alloy tool steel with a special chrome plating that makes these tools not only long lasting but very attractive as well. Available in five different sizes, these HL-series tools come complete with plastic-dipped, cushion-grip handles. The HL14P opens to .5", the HL16P to 1", the HL18P to 1.25", the HL110P to 1.5" and the HL112P to a full 2.125".

030X371 HL14P 4" Groove Joint Plier.....1-11, \$12.75 ea.; 12-up, \$11.50 ea.

030X374 HL16P 6" Groove Joint Plier.....1-11, 12.00 ea.; 12-up, 11.00 ea.

030X377 HL18P 8" Groove Joint Plier.....1-11, 12.75 ea.; 12-up, 11.50 ea.

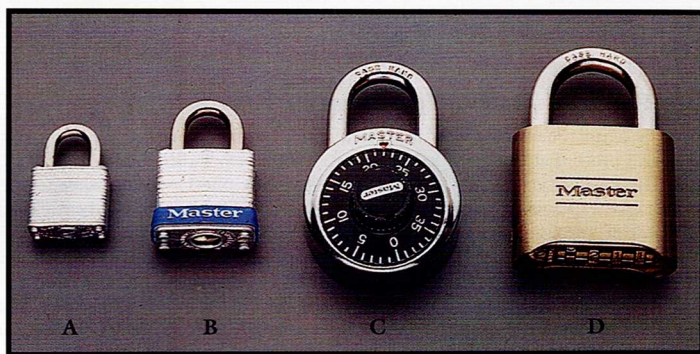
030X387 HL110P 10" Groove Joint Plier.....1-11, 12.25 ea.; 12-up, 11.00 ea.

030X389 HL112P 12" Groove Joint Plier.....1-11, 14.00 ea.; 12-up, 12.75 ea.

Triple Tap Tool

Ingenious tool developed for cleaning and chasing burred threads. Features a replaceable, chrome-finished 3" steel blade threaded to tap three hole sizes (6-32, 8-32, 10-32). The tool is supplied with a clear plastic handle that is slightly oversized for ease of use and an all chrome-plated steel shank that is built to last. Overall dimension is 7.25".

060X294 Model 625-32 Triple Tap Tool...1-5, \$11.50 ea.; 6-up, \$10.50 ea.



Master Locks

A. #10 Pilfer-Proof Lock: Designed for applications not requiring high security. Especially useful for locking small tool boxes, drawers and parts cabinets. Body is 1" wide; shackle is .16" in diameter and has a clearance of .38" horizontally x .44" vertically. Supplied with two nickel-plated keys.

067X010 #10 Padlock.....1-11, \$2.50 ea.; 12-up, \$2.25 ea.

B. #7 Security Lock: Widely used for securing tool chests, equipment cases, security closets. Body is 1.13" wide; shackle is .19" in diameter with a clearance of .5" horizontally x .56" vertically. Comes with two brass keys.

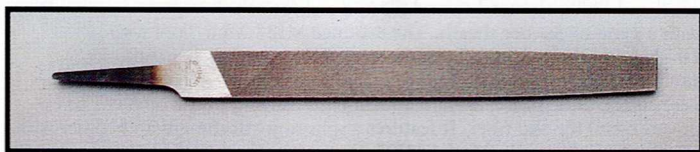
067X007 #7 Padlock.....1-11, \$7.00 ea.; 12-up, \$6.50 ea.

C. #1500 Combination Lock: Smooth three-number dialing with easy-to-read numbers and sure-grip serrated knob. Thousands of possible combinations. Body measures 1.88" wide; shackle is .28" in diameter and has a clearance of .81" horizontally x 3/4" vertically.

067X150 #1500 Combination Lock.....1-11, \$5.50 ea.; 12-up, \$5.00 ea.

D. #175 Resettable Combination Lock: Makes remembering your combination easy - just program a familiar number. Over 10,000 possible settings. Body measures 2" wide; shackle is .3" in diameter and has a clearance of 1" horizontally and vertically.

067X125 #175 Resettable Lock.....1-11, \$19.00 ea.; 12-up, \$17.00 ea.



Files

Grober's American Pattern Files are unsurpassed for quality and workmanship. They are made from the finest tool steel and are uniform in cut to permit the removal of more metal faster. Extremely durable and scientifically balanced, each is the product of a long tradition of superior craftsmanship combined with the most advanced technology. Each and every file is heat treated to exacting standards for a far greater performance and longer life. We offer these files in 6" smooth cut and 8" second cut. Choose from three shapes. Also available is our handy FH2 wooden file handle that allows the files to be used most effectively and safely.

32.303-1 Flat 6" Smooth Cut File

048X0551-11, \$6.25 ea.; 12-up, \$5.65 ea.

32.297-1 Flat 8" Second Cut File

048X0501-11, \$6.80 ea.; 12-up, \$6.15 ea.

32.325-1 Half Round 6" Smooth Cut File

048X0951-11, \$8.50 ea.; 12-up, \$7.65 ea.

32.319-1 Half Round 8" Second Cut File

048X0881-11, \$9.75 ea.; 12-up, \$8.75 ea.

32.409-1 Round 6" Smooth Cut File

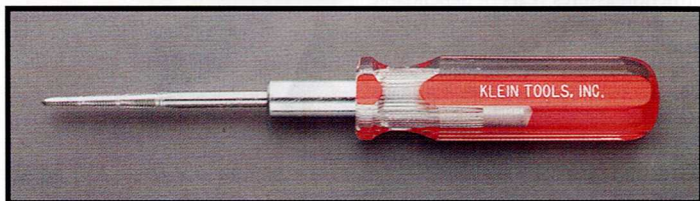
048X7301-11, \$5.25 ea.; 12-up, \$4.75 ea.

32.404-1 Round 8" Second Cut File

048X7251-11, \$5.50 ea.; 12-up, \$4.95 ea.

FH-2 File Handle

048X0031-11, \$2.00 ea.; 12-up, \$1.75 ea.



Multi-Plier®

The One-Tool Toolbox You Carry on Your Belt

The Multi-Plier® provides the benefits of a toolbox designed into a sturdy, compact piece that can be worn on a belt. This handy multi-dimensional tool will multiply your successes. Its 13 tools are heavy-duty pliers, serrated sheepfoot blade, crosshead screwdriver, small screwdriver, lanyard ring, scale, bottle opener, wire cutter, medium screwdriver, file, large screwdriver, drop point blade and can opener. This combination tool is made with the best heavy-gauge stainless steel components available. It comes with a ballistic cloth sheath.

Model 55800 is the stainless steel 13-tool Multi-Plier with folding ballistic cloth sheath. Two kits offer even more functions with 19 tools in one. A coupler/adaptor goes over the crosshead screwdriver tool, allowing access to six varying sized screwdriver bits. This coupler fits standard 1/4" tool bits so you can use Allen™ head or torque bits too. The folding sheath holds included couplers and bits to maintain the unit's compact design. Model 55250 Multi-Plier Tool Kit includes tool, sheath, coupler and six bits. Order 55200 for the Accessory Kit Only that includes the sheath, coupler and six bits. Limited lifetime warranty.

136X580 55800 Multi-Plier/Cloth Sheath.....1-11, \$59.00 ea.; 12-up, \$53.50 ea.
136X525 55250 Tool Kit with Bits1-11, 76.00 ea.; 12-up, 68.50 ea.
136X520 55200 Accessory Kit Only.....20.00 ea.

GERBER
LEGENDARY BLADES



Leatherman Tools®

Pocket Survival Tools

With Leatherman® Pocket Survival Tools, you get pliers and much more in single pocket tools. Fold-out blades give you numerous essentials in one convenient multi-purpose tool. The MI22 is the original Leatherman compact toolchest you can hold in your hand. At 4" closed, it weighs 5 ounces. Its 12 blades are needle-nose pliers, regular pliers, wire cutters, knife blade, ruler, can/bottle opener, four screwdrivers (large, medium, small and Phillips), metal/wood file and awl/punch. It comes with a genuine leather sheath. The 4-ounce MI23 Mini-Tool with 10 blades is 2 5/8" x 1" x 1/2" closed and unfolds into full-size, full-strength pliers over 6 inches long. Includes needle-nose pliers, regular pliers, wire cutter, knife blade, lanyard attachment, can and bottle openers, screwdriver, metal file and ruler. It features a split ring attachment and comes with a Ballistic cloth sheath. Model MI25 Tool with Crimper is 4" closed and weighs 5 ounces. It includes crimping tool and genuine leather sheath.

Model MI26 Super Tool™ is the ultimate tool with 10 locking blades for even more versatility. You get four screwdrivers (small, medium, large and Phillips), clip-point and serrated blades, regular pliers, needle nose pliers, wire stripper, wire cutters, 9-inch ruler, wood/bone saw, metal/wood file, can/bottle opener, electrical crimper and awl/punch. This tool features stainless steel blades and handles with optimum grade hardness. The blade



Leatherman

locking system is designed to prevent tools from folding during use. At 9 ounces and 7" open, it folds to 4 1/2" closed. Comes with genuine leather sheath. Twenty-five-year guarantee.

137X122 MI22 Large Tool1-11, \$57.00 ea.; 12-up, \$46.00 ea.
137X123 MI23 Small Tool.....1-11, 45.00 ea.; 12-up, 42.00 ea.
137X125 MI25 Tool w/ Crimper1-11, 69.75 ea.; 12-up, 64.50 ea.
137X126 MI26 Super Tool w/ Sheath...1-11, 71.50 ea.; 12-up, 64.50 ea.

SOG® ToolClip®

A Toolchest in Your Pocket

This is one of the most complete all-purpose tools ever made. The SOG® ToolClip® offers you 13 field options accessible in your pocket. It easily travels with you to accomplish any job. Tools include pliers, grippers, wire cutter, precision screwdriver, serrated blade, small and large wire strippers, large screwdriver, crosshatched file, spear-point blade, light-duty pry bar, bottle opener and utility blade.

Rigid, all stainless steel construction assures years of dependable service and reliability. Heavy-duty stainless steel clip securely fastens ToolClip to a pocket, belt or pack. Choose from two sizes: 5 1/4" or 3 3/4" micro model. Guaranteed against defects in workmanship and materials.

138X023 SOG23 ToolClip, 5 1/4"1-11, \$89.00 ea.; 12-up, \$81.00 ea.
138X028 SOG28 Micro ToolClip, 3 3/4" ..1-11, 56.00 ea.; 12-up, 50.50 ea.



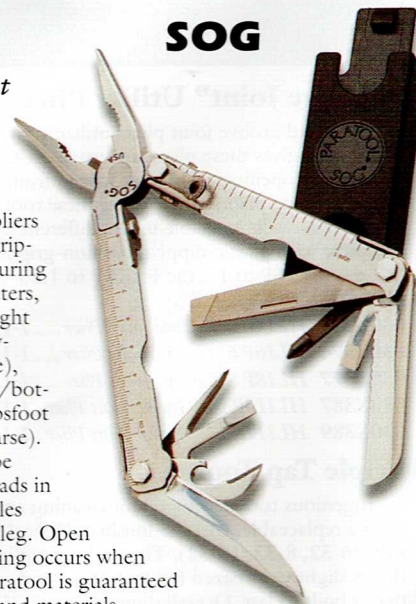
Paratool®

The All-Purpose Tool That Keeps You Prepared

The Paratool® is a statement of preparedness. It is one of the most comprehensive all-purpose tools ever made. You get three pliers (with fine, medium and coarse gripping surfaces), wire cutter, measuring scale in both inches and centimeters, thumb lanyard hole, 3-inch straight point blade, three flathead screwdrivers (fine, medium and coarse), Phillips #1 screwdriver, awl, can/bottle opener, 3-inch serrated sheepfoot blade and file (both fine and coarse).

One-handed operation can be achieved by holding the plier heads in one hand and opening the handles against a surface such as a pants leg. Open each handle one at a time. Locking occurs when handle is fully extended. The Paratool is guaranteed against defects in workmanship and materials.

138X031 SOG31 Paratool.....1-11, \$58.00 ea.; 12-up, \$52.50 ea.



SOG





Knife Chest



Nos. 1 and 5 knives, No. 2 knife handle with No. 24 blade plus assortment of 10 extra blades. Fitted wooden chest.

106X708 X5082.....1-11, \$19.95 ea.; 12-up, \$16.00 ea.

Deluxe Knife Chest

Nos. 1 and 6 knives, No. 2 knife handle with No. 24 blade plus assortment of 14 extra blades. Fitted wooden chest.

106X709 X5083.....1-11, \$28.50 ea.; 12-up, \$22.50 ea.



Bent Trimmers

Hot hammer-forged of high carbon cutlery steel. Double plated-chrome over nickel blades for full coverage rust protection. Black enamel handles.

Stock No.	Part No.	Full Length	Length of Cut	Prices	
				1-11	12-up
024X361	3316	6"	2 $\frac{3}{4}$ "	\$16.00	\$14.50
024X362	3317	7"	3 $\frac{1}{4}$ "	17.00	15.50
024X363	3318	8"	4"	19.25	19.50
024X364	3319	9"	4 $\frac{3}{8}$ "	23.50	21.25

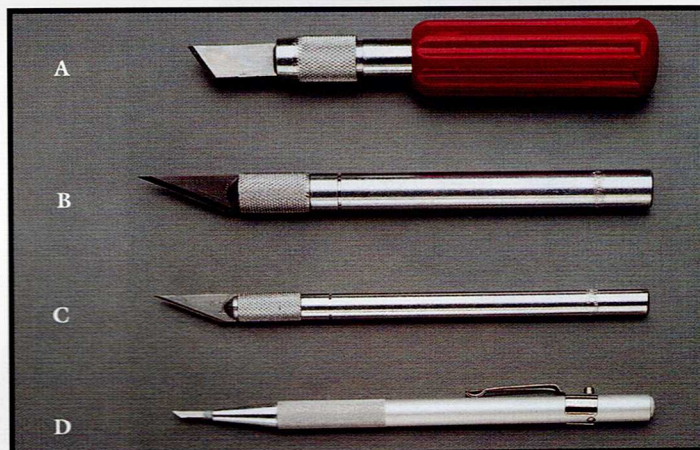


Zephyr® Stainless Steel Shears

The perfect shear for cutting paper, light fabric or similar materials. These Zephyr shears are lightweight, which makes them much more comfortable to use than traditional metal shears. Under normal use, they will retain their sharp edge, adjustment and perfect run longer than other lightweight models. Made from stainless steel metal, these shears resist rust and corrosion plus holds a keen edge. Excellent for any light to medium-duty job. Available in right or left hand models. The Model 208 right-hand shear measures 7.5" long and has a 3.25" maximum cut. The Model LH308 left-hand shear measures 8.5" and has a 3.5" maximum cut.

024X200 Model 208 Zephyr.....1-11, \$9.75 ea.; 12 up, \$8.80 ea.

024X050 Model LH308 Zephyr.....1-11, 11.75 ea.; 12-up, 10.60 ea.



Precision Knives

A. 3005 Heavy-duty knife, 4.25" long with No. 19 blade.

106X534 X3005 Heavy-Duty Knife.....1-11, \$5.40 ea.; 12-up, \$4.90 ea.

106X016 X219 (#19) Repl. Blades (pkg. 5).....2.15 ea.

B. 3002 Large precision knife, 5" long with No. 22 blade.

106X531 X3002 Knife.....1-11, \$4.50 ea.; 12-up, \$4.00 ea.

106X020 X222 (#22) Repl. Blades (pkg. 5).....3.75 ea.

C. 3001 Standard precision knife, 4.88" with No. 11 blade.

106X530 X3001 Standard Knife.....1-11, \$2.95 ea.; 12-up, \$2.65 ea.

106X008 X11 Repl. Blades (pkg. 5).....2.05 ea.

D. 3009 Deluxe, retractable push-button knife with No. 9 blade.

106X538 X3009 Retractable Knife.....1-11, \$9.65 ea.; 12-up, \$8.70 ea.

106X006 X209 (#9) Repl. Blades (pkg. 5).....6.40 ea.



Electrician's Scissors

Hot hammer-forged of high carbon cutlery steel. Completely double plated-chrome over nickel for full-coverage rust protection. Multi-purpose cutting tool for wire splicing or electronics work. Cuts all medium-gauge wires, insulation materials, harness ties.

Stock No.	Part No.	Full Length	Length of Cut	Prices	
				1-11	12-up
024X285	925	5"	1 $\frac{3}{4}$ "	\$11.75	\$10.60

Same as above except with two stripping notches for 19-gauge and 23-gauge wires.

Stock No.	Part No.	Full Length	Length of Cut	Prices	
				1-11	12-up
024X286	925C	5"	1 $\frac{3}{4}$ "	\$13.25	\$12.00



99 Utility Knife

STANLEY

A Stanley tradition. The #99 knife has been used and appreciated by industry for over 25 years for cutting packages, rope, canvas, wood, plastics, and other similar materials. It features a three-position retractable blade, full, half and one-quarter out, for maximum usefulness and complete safety. The model 99 is made of a lightweight die cast aluminum that separates in half for blade storage and easy installation. Comes complete with three each #11-921 heavy-duty straight blades. Additional blades may be purchased in convenient packages of five or economical boxes of 400.

087X400 10-099 #99 Retractable Knife...1-11, \$5.00 ea.; 12-up, \$4.50 ea.

087X420 11-921 Pkg. of 5 Repl. Blades....1-11, 2.00 ea.; 12-up, 1.75 ea.

087X422 11-921B Box /400 Repl. Blades...1-11, 68.00 ea.; 12-up, 60.00 ea.





3/8" Drive Sets

A. 18-Piece 3/8" Drive Socket Set

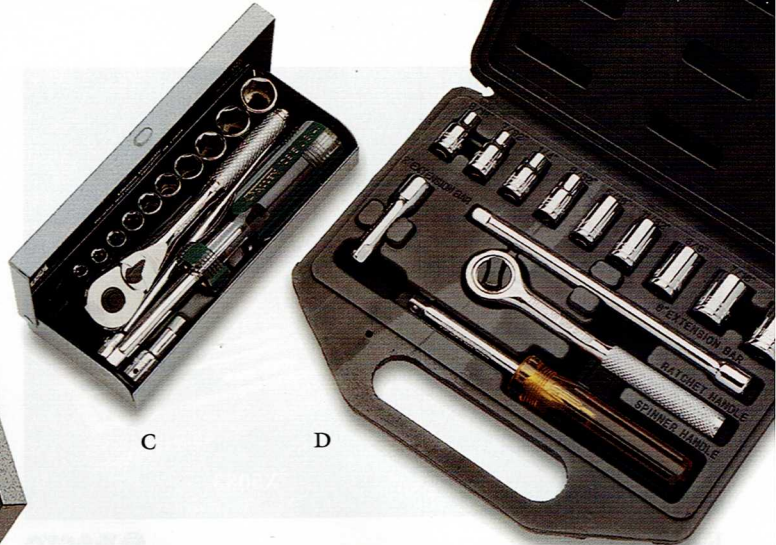
Includes seven 12-pt. standard sockets in sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4" plus seven 12-pt. deep sockets in sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4". Also includes 5/8" spark plug socket, 3" and 6" extensions plus ratchet quick release. This 18-piece set is attractively packaged in a high-impact metal box.

326X725 19123 3/8" Drive Set.....1-9, \$70.50 ea.; 10-up, \$65.00 ea.

B. 14-Piece 3/8" Drive Metric Socket Set

This set includes 10 metric 12-pt. standard sockets in sizes 10 mm, 11 mm, 12 mm, 13 mm, 14 mm, 15 mm, 16 mm, 17 mm, 18 mm and 19 mm. Also includes 5/8" spark plug socket, 3" and 6" extensions plus ratchet quick release. Packaged in a sturdy, high-impact metal box.

326X722 19117 3/8" Drive Set.....1-9, \$53.00 ea.; 10-up, \$49.00 ea.



1/4" Drive Sets

C. 14-Piece 1/4" Drive Metric Socket Set

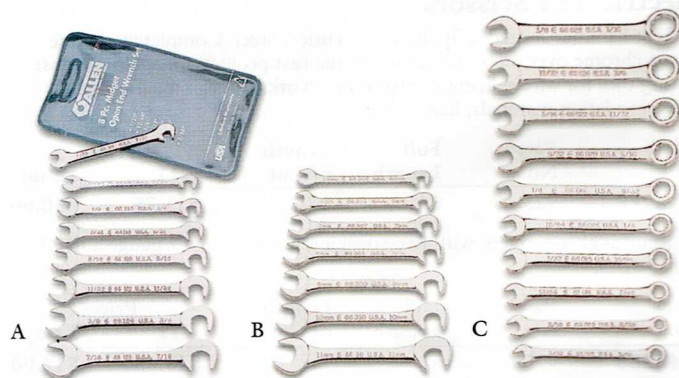
You get 10 metric 6-pt. standard sockets in sizes 4 mm, 5 mm, 6 mm, 7 mm, 8 mm, 9 mm, 10 mm, 11 mm, 12 mm and 13 mm. Also includes 1.5" and 6" socket extensions, spinner handle and ratchet quick release. Attractively packaged in a sturdy metal box.

326X710 19016 1/4" Drive Set.....1-9, \$45.50 ea.; 10-up, \$42.00 ea.

D. 14-Piece 1/4" SAE Socket Set

This standard 1/4" drive set is included in many of our tool kits. It contains nine SAE 6-pt. standard sockets in sizes 3/16", 7/32", 1/4", 9/32", 5/16", 11/32", 3/8", 7/16" and 1/2". The SS-1 also includes 1/4" drive ratchet handle, 2" and 6" extensions plus 6" spinner handle in a plastic tool box.

083X001 SS-1 1/4" Drive Set.....1-9, \$17.00 ea.; 10-up, \$15.00 ea.



Miniature Wrench Sets

For adjusting and tightening small electrical/electronic assemblies, these miniature wrench sets feature nickel chrome plating for maximum corrosion resistance, high-quality alloy steel, polished heads and panels plus distinctive size markings for easy identification.

A. Eight-Piece Midget Open-End Wrench Set

Includes eight wrenches in sizes 7/32", 15/64", 1/4", 9/32", 5/16", 11/32", 3/8" and 7/16". Overall lengths of 3 3/4"-4 1/8". Handy, see-through vinyl pouch.

326X805 29121 Midget Wrench Set1-9, \$22.00 ea.; 10-up, \$20.25 ea.

B. Seven-Piece Metric Midget Open-End Wrench Set

This set includes seven wrenches in sizes 5.5 mm, 6 mm, 7 mm, 8 mm, 9 mm, 10 mm and 11 mm. Overall lengths of 3 3/4"-4 1/8". Packed in a handy, see-through vinyl pouch.

326X803 29122 Metric Midget Set1-9, \$22.00 ea.; 10-up, \$20.25 ea.

C. 10-Piece Midget Combination Wrench Set

Contains 3/16" x 5/32", 5/32" x 3/16", 13/64" x 7/32", 7/32" x 15/64", 15/64" x 1/4", 1/4" x 9/32", 9/32" x 5/16", 5/16" x 11/32", 11/32" x 3/8" and 3/8" x 7/16". Overall lengths range from 2 5/8" to 3 5/8". Plastic snap closure case.

326X826 29015 Midget Combo Set.....1-9, \$23.50 ea.; 10-up, \$21.75 ea.



Combination Wrench Sets

Professional-quality, industrial-grade combination wrench sets feature nickel chrome plating for maximum corrosion resistance, high-quality alloy steel, polished heads and panels plus chamfered lead-ins on open and box ends for easy attachment to fasteners.

D. Seven-Piece Standard Combination Wrench Set (not pictured)

Includes seven 12-pt. wrenches in sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4". Overall lengths of 5 1/4"-8 3/4". Packed in a convenient vinyl pouch.

326X825 29014 Combo Wrench Set.....1-9, \$39.75 ea.; 10-up, \$37.00 ea.

E. 14-Piece Standard Combination Wrench Set

You get 14 12-pt. wrenches in sizes 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 15/16", 1", 1 1/16", 1 1/8" and 1 1/4". Overall lengths of 5 1/4"-16 7/8". Packaged in a deluxe vinyl tool roll.

326X821 29010 Combo Wrench Set1-9, \$155.00 ea.; 10-up, \$143.00 ea.

F. Seven-Piece Metric Combination Wrench Set (not pictured)

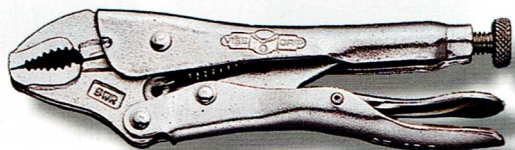
Includes seven 12-pt. wrenches in sizes 7 mm, 9 mm, 10 mm, 11 mm, 13 mm, 14 mm and 15 mm. Overall lengths of 4 1/4"-7 3/8". Comes packaged in a tool roll.

326X830 29018 Metric Combo Set.....1-9, \$38.00 ea.; 10-up, \$35.00 ea.





4-LN



5-WR

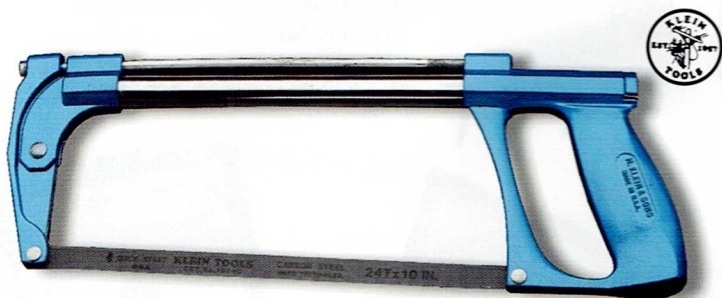
Vise-Grip Locking Hand Tools

Vise-Grip tools mean power. A simple hand squeeze can put over 1 ton of controlled pressure between the jaws. These Vise-Grip tools make every job easier as they are perhaps the most versatile tools you can own.

Only the finest high-grade alloy steels are used in their manufacture. Each one is heat-treated for maximum toughness and durability and has a bright nickel-plated finish. Other features that make these tools so special are a built-in wire cutter that will cut just about anything up to a .25" bolt, a micro-adjusting mechanism that adjusts to exactly the amount of pressure required and an easy-release trigger that instantly snaps the jaws open.

We offer two basic styles of Vise-Grip Pliers and Long Nose Pliers that are designed to reach all those places that fingers can't (and lock on tight!) plus traditional Vise-Grip curved jaw pliers that feature the familiar knurled tips and wire cutters. We offer all three of the popular sizes of long nose pliers and four sizes of traditional lever-wrench tools.

- 321X012 4-LN (4" Long Nose-Type)1-9, \$9.75 ea.; 10-up, \$9.00 ea.
 321X030 6-LN (6" Long Nose-Type)1-9, 10.50 ea.; 10-up, 9.75 ea.
 321X076 9-LN (9" Long Nose-Type)1-9, 14.00 ea.; 10-up, 12.50 ea.
 321X015 4-WR (4" Vise-Grip Plier)1-9, 9.25 ea.; 10-up, 8.50 ea.
 321X020 5-WR (5" Vise-Grip Plier)1-9, 9.75 ea.; 10-up, 8.75 ea.
 321X055 7-WR (7" Vise-Grip Plier)1-9, 10.50 ea.; 10-up, 9.50 ea.
 321X095 10-WR (10" Vise-Grip Plier)1-9, 10.50 ea.; 10-up, 9.75 ea.



Industrial Hacksaws

A rugged, heavy-duty saw with the versatility to satisfy professional requirements. Features strong, twist-proof construction-tubular steel frame, die-cast zinc handles with blue finish. Smooth, large-sized grip and curved front-end design for comfortable two-hand use. Storage chamber for extra blades. Supplied with blade. Available in two sizes.

- 060X375 701-10 10" Hacksaw1-11, \$24.50 ea.; 12-up, \$22.00 ea.
 060X376 701-12 12" Hacksaw1-11, 25.00 ea.; 12-up, 22.50 ea.
 060X493 1024C 10" Repl. Blades (pkg./10)10.00 pkg.
 060X523 1224C 12" Repl. Blades (pkg./10)10.00 pkg.

CooperTools



STANLEY

Hammers

These professional-quality hammers are the choice of professionals everywhere. All heads are forged from high quality carbon steel and heat treated to the proper hardness for optimum strength and durability. Other features include carefully beveled face for proper striking angle which is chamfered to help prevent chipping, epoxy bonded handle and head to assure secure and rigid attachment plus high-grade hardwood handles.

Ball Pein

Stock No.	Part No.	Size	Prices	
			1-11	12-up
326X592	25700	2 oz.	\$12.75	\$11.50
087X504	54-004	4 oz.	13.50	12.50
087X508	54-008	8 oz.	14.25	13.00
087X512	54-012	12 oz.	16.50	15.25
087X516	54-016	16 oz.	17.25	15.75
087X524	54-024	24 oz.	19.75	18.25

Curved Claw

Stock No.	Part No.	Size	1-11	12-up
087X460	51-351	16 oz.	\$21.90	\$20.00
087X465	51-353	20 oz.	24.75	22.75



Standard Adjustable Wrenches

These adjustable wrenches are hot-forged from special alloy steel and are chrome plated with side of head buffed to a high, beautiful lustre. Jaw design provides greater strength and better fit on both square and hex nuts. Thinner head gets into tighter places. Rugged I-Beam handle and reinforcement of critical stress areas assure maximum strength and long service. Each adjustable wrench is furnished with a highly visible, yellow vinyl grip that is grease resistant, non-slip and non-sparking. Available in five popular sizes.

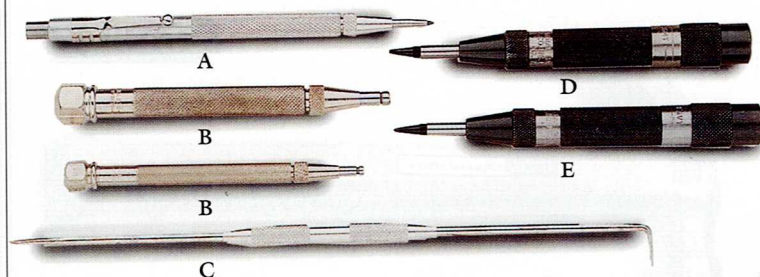
- 083X104 AW-4 (4")1-11, \$ 6.00 ea.; 12-up, \$ 5.40 ea.
 083X106 AW-6 (6")1-11, 6.50 ea.; 12-up, 5.85 ea.
 083X108 AW-8 (8")1-11, 7.00 ea.; 12-up, 6.30 ea.
 083X110 AW-10 (10")1-11, 9.00 ea.; 12-up, 8.10 ea.
 083X112 AW-12 (12")1-11, 12.50 ea.; 12-up, 11.25 ea.

Slip Joint Plier

A slip joint plier with wire cutter made from special steel, drop forged, machined and hardened by special methods to meet the most exacting standards. Knurled handles.

- 030X465 G26, 6"1-5, \$8.75 ea.; 6-up, \$8.00 ea.





Machinist Scribes

A. Carbide Scribe: Tungsten Carbide tip at one end, Alnico permanent magnet on the other. Point reverses for safety.

046X120 Model 88-CM1-11, \$5.50 ea.; 12-up, \$4.95 ea.

B. Pocket Scribes: Replaceable points are hardened and centerless ground. Point reversible into knurled body when not in use.

046X112 Model 81 5 7/8"1-11, \$4.60 ea.; 12-up, \$3.60 ea.

046X114 Model 83 4 3/4"1-11, 3.50 ea.; 12-up, 3.15 ea.

C. Machinist Scribe: Double-edged machinist scribe with one straight end and the other angled at 90°.

070X510 Model 76-15101-11, \$2.50 ea.; 12-up, \$2.20 ea.

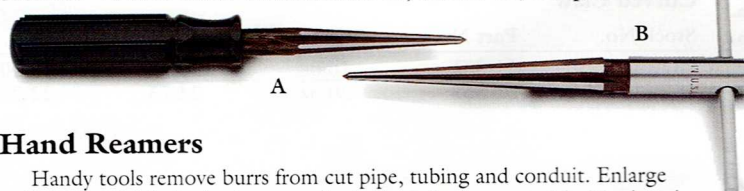
Trace Cutter/Automatic Punch

D. Trace Cutter: Unique tool accurately cuts individual conductor traces on pcbs. Fine adjustment permits precise cutting of different copper weights. Prevents damaging most pcb substrates.

046X108 79-CT Trace Cutter1-11, \$21.00 ea.; 12-up, \$18.90 ea.

E. Auto Center Punch: For marking work in layout and drilling operations. Unique single-hand operation eliminates need for striking with hammer. Adjust spring tension for light to heavy strokes; set depth for repetitive work. Body diameter is 1/2"; overall length is 5". All steel construction.

046X109 79 Auto Center Punch1-11, \$19.50 ea.; 12-up, \$17.50 ea.



Hand Reamers

Handy tools remove burrs from cut pipe, tubing and conduit. Enlarge and countersink holes in sheet metal, plastic and other materials. Hardened, tempered tool steel with precision ground cutting edges.

A. Screwdriver Handle Reamer: Easy-to-use screwdriver handle for small, precise reaming applications. Hardened tool steel blade and fluted plastic handle for maximum versatility. Capacity is 1/8" to 3/8".

046X177 131 Screwdriver Reamer1-11, \$11.00 ea.; 12-up, \$9.90 ea.

B. T-Handle Reamer: Provides leverage for easy reaming. Remove burrs or enlarge small holes in steel, aluminum and plastic. Capacity is 1/8" to 1/2".

046X176 130 T-Handle Reamer1-11, \$12.50 ea.; 12-up, \$11.25 ea.



KO-Master™ Knockout Kits

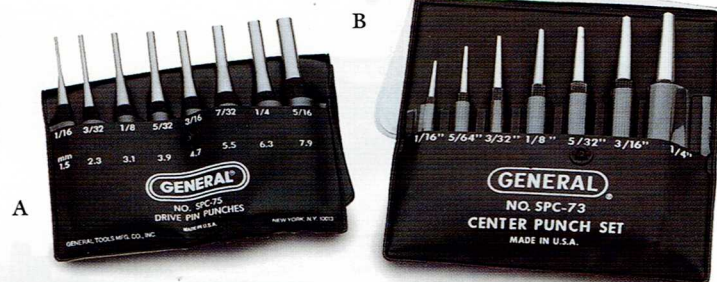
KO-Master Knockout Punches are designed with patented two-point cutting design with hardened edges that split slug in half for easy removal from die. High-strength chrome-moly design increases performance up to 20 times normal life. Cuts through stainless steel, mild steel, plastic and fiberglass. Case-hardened threads reduce chance of cross-threading.

The 35-760 includes 1/2", 3/4", 1" and 1 1/4" punch die sets with 3/8" and 3/4" draw studs. It weighs 6.6 pounds. The 35-775 contains 1/2" through 2" punch die sets with 3/8" and 3/4" draw studs plus 35-799 hex head ratchet tool. It weighs 12.8 pounds. Each set comes in a convenient 18" x 7.25" x 6" heavy-duty plastic storage case.

370X123 35-760 Knockout Kit1-5, \$112.00 ea.; 6-up, \$105.00 ea.

370X125 35-775 Knockout Kit1-5, 223.00 ea.; 6-up, 210.00 ea.

370X126 35-799 Hex Ratchet Tool Only35.00 ea.



Punch Sets

A. Drive Pin Punches: Each of these tool steel punches has been uniformly heat treated and centerless ground to withstand the toughest use. Features include 4" length with knurled bodies and ends ground square for accurate pin driving. Packaged as a set in a clear vinyl pouch.

046X088 SPC-75 Set of 81-11, \$27.00 ea.; 12-up, \$24.50 ea.

B. Center Punches: Machinists use these center punches for marking work in layout and drilling operations. These tools are constructed of hardened and ground alloy tool steel for maximum strength and durability. Additional features include square knurled body, size stamped for easy identification and packaged as a set in a clear vinyl pouch.

046X073 SPC-73 Set of 71-11, \$29.30 ea.; 12-up, \$26.50 ea.



Eight-Piece Needle File Kit

Deluxe needle files for micro or miniature applications. Files are 6 1/4" long and feature plastic-dipped, cushion grip handles. Includes eight styles: knife, oval, equaling, triangular, round, half-round, square and flat. Comes in a clear plastic pouch. A great addition to any instrument repair tool kit.

2100 File Set

088X210

1-11, \$29.00 ea.; 12-up, \$25.50 ea.



Hole Saw Kits

Saw follows through, and knock-out slots permit easy core removal. Molybdenum high-speed steel cutting cages are welded to shatter-resistant steel backs for safe cutting. Cutting depth of 1 1/8" with six teeth per inch.

A. Basic Hole Saw Kit: Compact kit contains mandrel, adapter and six popular high-speed sized hole saws: 7/8", 1 1/8", 1 3/8", 1 3/4", 2" and 2 1/2". Convenient plastic box.

060X814 31180 Basic Kit1-5, \$104.50 ea.; 6-up, \$94.00 ea.

B. Deluxe Hole Saw Kit: Complete set contains two mandrels, adapter, pilot drill and eight popular pipe/tubing sized hole saws: 3/4", 7/8", 1 1/8", 1 1/2", 1 3/4", 2", 2 1/4" and 2 1/2". Convenient plastic box.

060X815 31183 Deluxe Kit1-5, \$135.00 ea.; 6-up, \$121.50 ea.





Electro-Matic Hot Melt Glue Gun

This automatic lever feed glue gun bonds almost anything permanently in 30-120 seconds without need of mixing or clamping. The lightweight TR-550 features an electronic solid-state design with a high-impact, high-temperature housing. A unique design keeps heat away from the contoured handle. The TR-550's lever-feed clutch mechanism prevents glue back up. Its patented shape and easy-squeeze lever action provide extra control and tireless operation. Other features include interchangeable nozzle, check valve to control glue flow and high-volume melt chamber for fast, steady and even application. A solid-state P.T.C. heating system provides quick heat up and holds temperature for smooth, consistent bonding. Includes built-in drip tray/stand and reusable storage box. This .7-pound gun measures 7.5" x 6.5" x 1.2". One-year home-use warranty.

Choose from three types of glue, each with six 4-inch sticks per package. Use AP5 All-Purpose Clear Glue Stix for most general repairs. Press surfaces together for 15 seconds to set in 30-60 seconds. SS6 Slow-Set Glue Stix allow more time for line up on larger areas. They set in 90-120 seconds. Use CS7 White Caulk/Sealer/Glue Stix for caulking and sealing. They set in 30-60 seconds. All packed six per package.

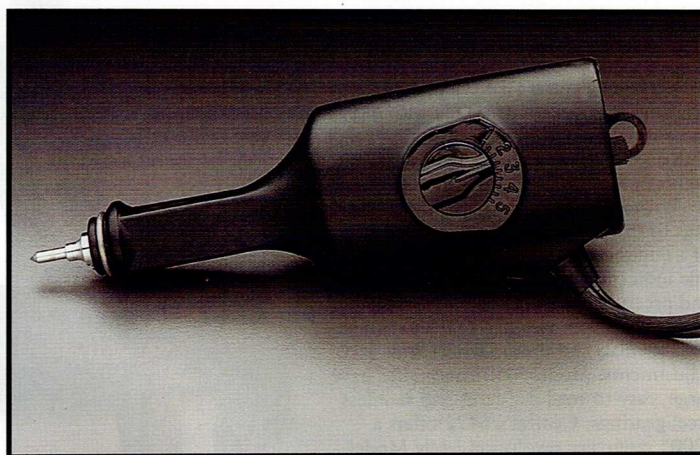
- 012X300** TR550 Glue Gun1-5, \$26.00 ea.; 6-up, \$23.50 ea.
012X311 AP5 All-Purpose Glue Stix.....1-23, 3.50 pkg.; 24-up, 3.00 pkg.
012X333 SS6 Slow-Set Glue Stix.....1-23, 3.50 pkg.; 24-up, 3.00 pkg.
012X322 CS7 Caulk/Sealer/Glue Stix.....1-23, 3.50 pkg.; 24-up, 3.00 pkg.



Professional Solder Gun Kit

This eight-piece heavy-duty soldering kit features the versatile Weller Model D550-PK soldering gun with tin-plated, heavy copper tip. The gun features a two-position trigger for a dual selection of heats, comes up to temperature in 6 seconds and has twin lights to illuminate work. This heavy-duty kit also includes two spare un-tinned tips, flux brush, soldering aid tool, coil of 40/60 rosin-core solder and sturdy plastic carrying case plus soldering hints booklet. UL-listed. Full color informative packaging.

- 104X122** D550-PK Solder Gun Kit1-5, \$51.50 ea.; 6-up, \$47.50 ea.



Electric Engraver

Just the thing for etching or marking initials, serial numbers, etc. into tools and equipment in the shop or lab. The 290 engraver writes like a pencil on material from hardened steel to glass. It features a calibrated stroke adjustment that regulates the depth of engraving from fine lines to deep marks. Comes complete with carbide engraving point that is suitable for most applications. An optional diamond engraving point is also available for continuous-duty industrial work or very hard-to-etch substances.

- 036X290** 290 Engraving Tool.....1-5, \$25.50 ea.; 6-up, \$23.00 ea.
036X961 9924 Replacement Carbide Point.....6.50 ea.
036X962 9929 Optional Diamond Point.....19.00 ea.



Ultrasonic Cleaners

AB AMERICAN BEAUTY

Clean small parts without rubbing, scrubbing or disassembly. These ultrasonic cleaners are perfect for printed circuit boards, potentiometers, bearing assemblies, brushes, intricate tubing, glassware, etc. Their small size and simple operation make ultrasonic cleaning practical at the work bench as well as the lab table. These units are completely self-contained and self-tuned with solid-state circuitry for dependability and long life. Operation is easy. High-frequency sound waves (50,000-55,000 cycles per second) are introduced into a liquid tank, creating millions of microscopic bubbles. The expansion and collapse of the bubbles cause lightning fast scrubbing action. These bubbles invade all recesses and openings (wherever liquid can penetrate by flow or capillary action), blasting away residues and accumulations. All without damaging or altering the items being cleaned and without causing any R.F.I. interference. Choose from three sizes. Each model comes complete with a stainless steel tank cover and complete operating instructions.

- S-3300** (5" x 5" x 3" tank size)
006X8401-2, \$392.00 ea.; 3-up, \$373.00 ea.
S-5500 (9" x 5" x 4" tank size)
006X8421-2, \$572.00 ea.; 3-up, \$544.00 ea.
S-9900 (11.5" x 9.5" x 6" tank size)
006X8481-2, \$1220.00 ea.; 3-up, \$1159.00 ea.



Dial Calipers

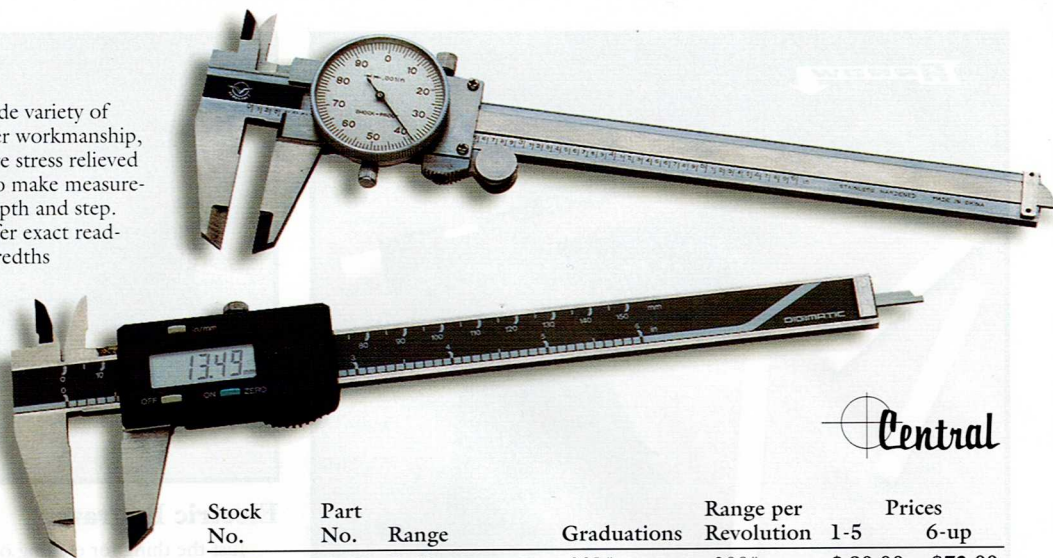
For Precision Measurements

Versatile Central Dial Calipers perform a wide variety of precision measurements. Made with high-caliber workmanship, these stainless-steel precision-ground calipers are stress relieved with a satin chrome finish. They are designed to make measurements in four different ways: inside, outside, depth and step.

With a dial indicator scale, these calipers offer exact readings to the thousandth of an inch or five-hundredths of a millimeter. The dial indicator has a fine-line indicating hand for precise readings and precise measurements.

Choose from two dial calipers with adjustable dials and thumb wheel fine adjustments. Models 6422 and 6427 have large, easy-to-read dial faces and stainless steel gears. Central's 6422 offers a .200" range per revolution while Model 6427's range is .100".

The 6425 features a five-digit electronic readout that virtually eliminates measurement errors. It is self-calibrating and easily converts from English to metric at the push of a button. One-year warranty.



Stock No.	Part No.	Range	Graduations	Range per Revolution	Prices	
					1-5	6-up
020X210	6422	0-6"	.001"	.200"	\$ 80.00	\$72.00
020X227	6427	0-6"	.001"	.100"	70.00	63.00
020X225	6425	0-6", 0-150 mm	.001"	N/A	205.00	185.00



Micrometer

Precision measurements to the ten-thousandth of an inch require a quality micrometer. Central Tool Company manufactures just what you need. This 0 to 1-inch micrometer is American made and offers a host of features.

Extra-Hard Measuring Surfaces of the anvil and one-piece spindle are made of the finest quality tool steel. Careful lapping on our own special machinery assures that faces are square and parallel. **Simplified Zero Adjustment** lets you reset your Central mike simply with only a hex key.

Carbide Faces and .0001-Inch Graduations are standard. **Easy Reading Graduations** feature machine speed. All thousandth graduations are numbered so you can read directly without counting. **Friction Stop** provides uniform pressure under all measuring conditions. **Spindle Lock** holds spindle securely for transferring measurements. **I Beam Frame** is drop forged to maintain dimensional stability.

020X065 Model 6011 0-1"1-5, \$90.00 ea.; 6-up, \$81.00 ea.

GPP Gauges

Economy Push-Pull Tension Gauges

These high-impact polystyrene-cased instruments from Jonard are low priced to fit everyone's tool box. They are simplified in construction yet with accuracies to 1 graduation. GPP Gauges are ideal for field service use, tape recorder adjustments, schools and many other applications requiring maintenance-free gauges. They feature excellent dial readability with bold numbers against a glare-free background.

Push-Pull Gauges are graduated in both avoirdupois and metric capacities. Choose from four capacities of 8 ounces to 15 pounds. Each instrument measures 1.5" x 1" x 14.5". One-year warranty.

Stock No.	Part No.	Avoirdupois Capacity	Metric Capacity	Prices	
				1-9	10-up
054X412	GPP-8	8 oz. x .25 oz.	220 g x 5 g	\$45.00	\$41.50
054X415	GPP-36	36 oz. x .5 oz.	1020 g x 20 g	45.00	41.50
054X425	GPP-72	72 oz. x 1 oz.	2025 g x 25 g	45.00	41.50
054X413	GPP-15	15 lbs. x 4 oz.	6084 g x 100 g	45.00	41.50

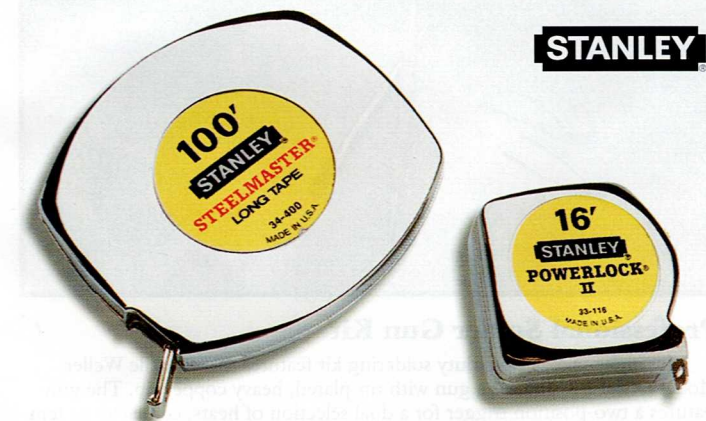
Stanley Powerlock II Steel Tapes

Easy feed, positive lock and smooth power return. Thumb-action control knob placed for convenient, efficient use. Black numerals on yellow background. For inside and outside measuring. Tough Du Pont Mylar coating resists abrasion, rust, most oils and acids; lasts up to 10 times longer than ordinary finishes. Tape graduated on both edges in 16ths, inches and feet. Stud markings indicated. Useful reference tables on reverse side of 10', 12' and 16' tapes. Chrome-plated case. Replaceable blade. Belt clip.

Stock No.	Cat. No.	Length	Width	Prices	
				1-11	12-up
087X330	33-310	10'	3/4"	\$13.25	\$12.25
087X332	33-312	12'	3/4"	14.50	13.25
087X326	33-116	16'	3/4"	18.00	16.50
087X334	33-320	20'	3/4"	19.50	18.00
087X338	33-425	25'	1"	21.25	19.50

50-Foot and 100-Foot Steel Tapes

Smooth, easy feed-and-return action. Snapout reel-in knob. Steel tape features red and black numerals on a yellow background. Stud markings are indicated. Graduated in eighths, inches and feet. Tough, protective Du Pont



Mylar coating resists oil, alkali, acids and rust. The chrome-plated, die-cast case is hand-contoured.

087X345 34-350 (3/8" x 50')1-5, \$24.50 ea.; 6-up \$22.50 ea.
087X350 34-400 (3/8" x 100')1-5, 36.50 ea.; 6-up, 33.50 ea.



SPC RAM Tweezers

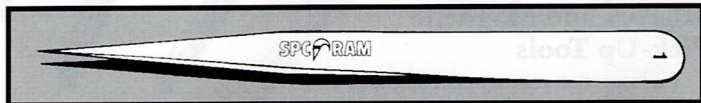
On this page we are pleased to offer you a wide selection of our most popular tweezers. Patterned after the original jeweler's or watchmaker's tools, these Dumont-style tweezers have become indispensable to the electronics industry. They are used in electronic assembly, wafer handling, precision soldering, microscopic inspection and pcb stuffing.

These tweezers are precision tools. Each has been carefully hand finished by European craftsmen to very exacting specifications. They are made of the finest quality steel to assure the most precise performance, even when used under a microscope. We are pleased to offer the following assortment of tweezers of various lengths, metals, thickness and range of uses.



00 — Sturdy 4 3/4" general-purpose assembly tweezer with very slim points. Stainless, non-magnetic steel.

084X011 00-SSAM.....1-11, \$9.20 ea.; 12-up, \$7.80 ea.



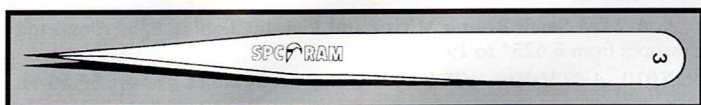
1 — Slender 4 1/2" tweezer designed for bending and handling very fine wires and components. Stainless, non-magnetic steel.

084X019 1-SSAM.....1-11, \$9.20 ea.; 12-up, \$7.80 ea.



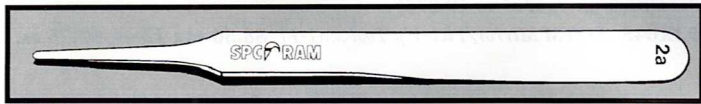
11 — This 4 1/2" tweezer has the same application as #1-SSAM except for metal. Made of nickel to be non-magnetic and non-scratching.

084X100 11-Nickel.....1-11, \$10.25 ea.; 12-up, \$8.70 ea.



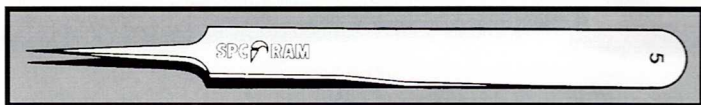
3 — Popular 4 3/4" precision-point tweezer for microelectronic work. Stainless, non-magnetic steel.

084X031 3-SSAM.....1-11, \$9.20 ea.; 12-up, \$7.80 ea.



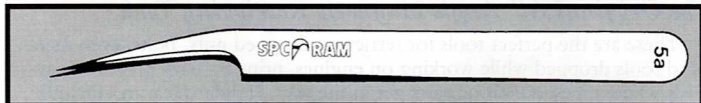
2a — Flat 4 1/2" rounded tips are useful for handling various micro-components. Stainless, non-magnetic steel.

084X024 2a-SSAM.....1-11, \$9.20 ea.; 12-up, \$7.80 ea.



5 — Tapered 4 1/2" micro-pointed for use in die attaching and wire bonding for micro-electronic assembly. Stainless, non-magnetic metal.

084X051 5-SSAM.....1-11, \$10.00 ea.; 12-up, \$8.50 ea.



5a — This 4 1/2" tool has the same application as #5-SSAM except for off-set angle for easy access and visibility. Stainless, non-magnetic metal.

084X056 5a-SSAM.....1-11, \$10.00 ea.; 12-up, \$8.50 ea.



7 — Curved 4 1/2" tip allows maximum visibility under magnified applications. Stainless, non-magnetic steel.

084X070 7-SSAM.....1-11, \$10.00 ea.; 12-up, \$8.50 ea.



6 — Angled 4 1/2" precision point is used to manipulate very minute components or parts. Stainless, non-magnetic steel.

084X060 6-SSAM.....1-11, \$12.50 ea.; 12-up, \$10.75 ea.



SS — Extra long length of 5 1/2" increases operator safety while working near high temperatures, etc. Stainless, non-magnetic steel.

084X009 SS-SSAM.....1-11, \$9.50 ea.; 12-up, \$8.10 ea.



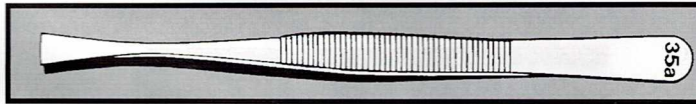
MM — Straight-point 5" general-purpose assembly tweezer. Nickel-plated, carbon steel. Economical.

084X007 MM.....1-11, \$6.25 ea.; 12-up, \$5.30 ea.



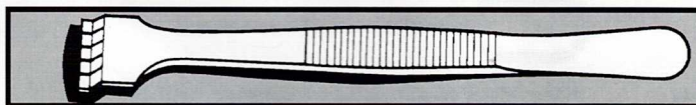
15a — Angled 4 1/2" cutting tweezer for cutting soft copper, gold, silver, etc. up to .010". High-strength carbon steel.

084X115 15a-Carbon.....1-11, \$25.50 ea.; 12-up, \$21.75 ea.



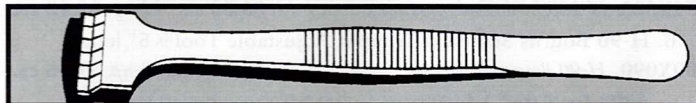
35a — Broad tip 4 3/4" tweezer is useful for handling delicate electronic parts. Stainless, non-magnetic steel.

084X135 35a-SSAM.....1-11, \$9.75 ea.; 12-up, \$8.30 ea.



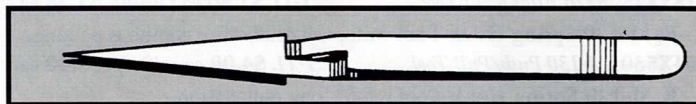
500a — A 5" wafer-handling tweezer with parallel fingers for maximum contact. For up to 4" wafers. Stainless, non-magnetic steel.

097X340 500a-SA.....1-11, \$16.00 ea.; 12-up, \$14.75 ea.



600a — This 5" wafer-handling tweezer is similar to 500a above except wider for 5" and 6" wafers. Stainless, non-magnetic steel.

097X525 600a-SA.....1-11, \$17.00 ea.; 12-up, \$14.50 ea.



57.750-1 — Sharp 4 3/4" smooth-pointed, self-closing assembly tweezer. Holds work in place while soldering, etc.

048X900 57.750-1.....1-11, \$4.00 ea.; 12-up, \$3.40 ea.





Inspection Mirrors

Fast, accurate visual inspection of hidden areas is possible with an almost limitless number of positions. Double ball joint links swivel mirrors for viewing to 360°. Ullman's precision-engineered links are manufactured from tempered spring steel to withstand the stresses of constant repositioning, move freely and hold desired positions. Choose from five pocket-sized models, all with insulated vinyl grips.

A. Model A-2 Circular Pocket Mirror is .88" in diameter with 7.5" overall length.

092X002 A-2 Circular Mirror.....1-11, \$5.00 ea.; 12-up, \$4.50 ea.

B. Model B-2 Oval Pocket Mirror is 1" x 2" with 8.5" overall length.

092X012 B-2 Oval Mirror.....1-11, \$5.25 ea.; 12-up, \$4.75 ea.

C. Model C-2 Circular Telescoping Mirror is 2.25" in diameter with 10" overall length that extends to 14".

092X022 C-2 Circular Telescoping.....1-11, \$7.75 ea.; 12-up, \$7.00 ea.

D. Model E-2 Circular Pocket Mirror is 1.25" diameter with 8" overall length.

092X039 E-2 Circular Mirror.....1-11, \$5.25 ea.; 12-up, \$4.75 ea.

E. Model K-2 Rectangular Telescoping Mirror is 2.125" x 3.5" with 11.25" overall length that extends to 15.25".

092X060 K-2 Rectangular Telescoping.....1-11, \$7.75 ea.; 12-up, \$7.00 ea.



Adjusting Tools

JONARD
INDUSTRIES CORP.

A. M-125 Spring Hook Tool is a 6" long push version.

054X525 M-125 Push Tool.....1-11, \$3.50 ea.; 12-up, \$2.95 ea.

B. H-90 Bourns Standard Trimpot Adjustable Tool is 5" long.

300X090 H-90 Bourns Tool.....1-11, \$2.50 ea.; 12-up, \$1.95 ea.

C. 5004 Insulated Adjustment Screwdriver (no metal) is 7" long.

318X805 5004 Alignment Tool.....1-11, \$1.25 ea.; 12-up, \$1.00 ea.

D. 8276 Duplex Aligner (one end recessed/other end extended) is 6.13" long.

318X845 8276 Alignment Tool.....1-11, \$1.50 ea.; 12-up, \$1.25 ea.

E. M-130 Spring Hook Tool with push/pull/lifter combo is 8" long.

054X530 M-130 Push/Pull Tool.....1-11, \$4.00 ea.; 12-up, \$3.40 ea.

F. M-120 Spring Hook Tool is a 6" long pull version.

054X520 M-120 Pull Tool.....1-11, \$3.50 ea.; 12-up, \$2.95 ea.

G. M-145 Captive Spring Hook Tool is a 6.5" long pull version.

054X533 M-145 Captive Spring Hook.....1-11, \$8.50 ea.; 12-up, \$8.00 ea.



2-TM Pocket Telescopic Inspection Mirrors and Magnetic Pick-Up Tools

An inspection mirror and a magnetic pick-up tool are combined in one handy pocket-sized unit. The 2-TM's tiltable mirror is perfect for inspecting behind obstructions or checking work in hidden areas on electronic equipment, engines, boats or anywhere. Double ball joints hold the mirror firmly at any angle. The replaceable Clearview copper-backed mirror folds down for convenient pocket storage.

A powerful long-life magnet at the other end of the bright, chrome-plated telescopic handle turns it into a pick-up tool. It is ideal for retrieving nuts, bolts and tools in hard-to-reach areas. With super telescoping action, the handy pocket size smoothly extends out to over 19" long. Features handy pocket clip. Choose from three two-in-one 2-TM versions.

A. A-2TM Small Round Mirror and Pick-up Tool is .875" round and telescopes from 5.625" to 19.5".

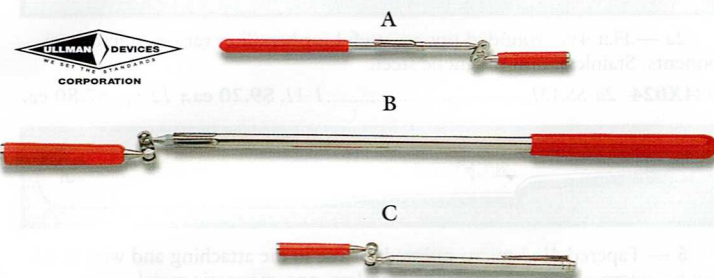
092X010 A-2TM Mirror/Pick-Up Tool.....1-11, \$8.25 ea.; 12-up, \$7.50 ea.

B. B-2TM Oval Mirror and Pick-up Tool is a 1" x 2" oval and telescopes from 5.625" to 20.75".

092X020 B-2TM Mirror/Pick-Up Tool.....1-11, \$8.50 ea.; 12-up, \$7.75 ea.

C. E-2TM Large Round Mirror and Pickup Tool is 1.25" round and telescopes from 5.625" to 19.875".

092X045 E-2TM Mirror/Pick-Up Tool.....1-11, \$8.50 ea.; 12-up, \$7.75 ea.



Pick-Up Tools

The Original All-Angle Magnetic Retrieving Tools

These are the perfect tools for retrieving dropped nuts, bolts, even metal hand tools dropped while working on engines, printers, back planes or any place where pipes, panels or parts get in the way. Standard features include solvent-free nylon heads, life-long magnets and bright chrome-plated telescoping handles. Choose from three styles of pick-up tools.

A. Model 3-JR Pick-Up Tool is a junior model with pocket clip. It has an overall length of 8.5" and folds to a compact 6" for pocket storage.

092X203 3-JR Pick-Up Tool.....1-11, \$5.75 ea.; 12-up, \$5.25 ea.

B. Model 1-SR Pick-Up Tool is the largest version. It telescopes to a full 26.75" and folds to 16.75".

092X201 1-SR Pick-Up Tool.....1-11, \$10.50 ea.; 12-up, \$9.50 ea.

C. Model 4-T Pick-Up Tool is a light-duty miniature pocket clip tool that fully extends to 19.5" and folds to a mere 4.5".

092X204 4-T Pick-Up Tool.....1-11, \$7.00 ea.; 12-up, \$6.25 ea.



Master Alignment Tool Kit — This comprehensive selection of the most commonly used alignment tools and adjusters is an invaluable addition to anyone's tool kit.

The 25-piece set includes all the trimmer/potentiometer and RF coil adjusting tools available. Model 8283 contains metal-tipped alignment screwdriver, screwdriver with plastic handle, plastic adjustment screwdriver, TV-FM tuning tool, K-tran alignment tool, core aligning tool, common TV alignment tool, universal alignment tool, metal-tipped duplex aligner, core aligning tool, short metal-tipped aligner, hex screwdriver combo tool, universal adjusting tool, short combo aligner, special hex tool, recessed-end alignment tool, long-reach duplex aligner, double-end screwdriver, recessed-end screw adjuster and Tel-A-Turn tool all in a handy roll-up tool pouch.

318X848 8283 Alignment Tool Kit.....1-11, \$44.00 ea.; 12-up, \$40.00 ea.



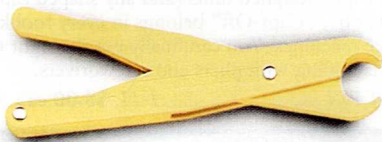
Electrical Tape — UL-60 electrical tape is a general-purpose PVC tape useful in many applications where a quick and reliable bond is required. It is flame retardant, cold and weather resistant, UL listed and is suitable for use up to 600 V. Supplied in 3/4" x 66-foot rolls.

300X066 UL-60 Tape.....1-24, \$1.75 ea.; 25-up, \$1.40 ea.



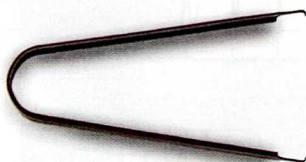
Solder Pak — Kester's 83-4000-000 pocket pak is a small and convenient tube of 60/40 resin-cored solder (.032 in diameter) used for most general electronic applications. A full .5 ounce of solder is supplied in a clear and reusable dispenser tube with a pocket clip.

058X999 83-4000-000 Pocket Pak1-24, \$1.50 ea.; 25-up, \$1.25 ea.



Fuse Puller — Ideal's 34-001 fuse puller was designed for use with small fuses (0 to 30 Amp). It is made of tough, high-impact nylon with handles that feature no-slip gripping surfaces with protective finger stops. Yellow in color and only 5" long.

370X100 34-001 Fuse Puller1-11, \$5.00 ea.; 12-up, \$4.50 ea.

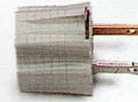


DIP Extractor — OK Industries' Model EX-1 DIP extractor is ideally suited for the lab engineer or field technician. Featuring simple, one-piece spring steel construction, it will extract all LSI, MSI and SSI devices from eight to 24 pins. Economically priced.

122X080 EX-1 Extractor1-11, \$3.50 ea.; 12-up, \$3.00 ea.

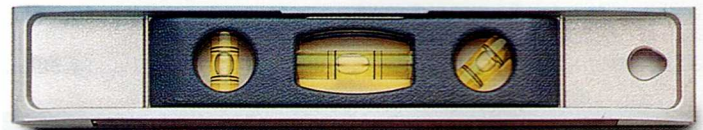
Partpicker — Xacto's very useful three-pronged tool facilitates the picking of small, hard-to-handle pieces with smooth, one-handed operation. Small parts, screws or nuts can be positioned, inserted or started in hard-to-reach places with minimal effort.

106X910 X73800 Partpicker1-11, \$7.25 ea.; 12-up, \$6.55 ea.



Three-Wire Adapter — The A100 grounded adapter from Mid State is designed to adapt a three-wire device to a standard two-wire outlet. It features molded plastic construction, high-quality contacts and a built-in terminal ring for grounding to the wall plate.

366X100 A-100 3-Wire Adapter.....1-24, \$1.00 ea.; 25-up, \$.75 ea.



Torpedo Level — Klein's 930-9 level is lightweight, precision made and only 9" long for use in tight places. It features three acrylic plastic vials — plumb, level and 45° mitre. Constructed of strong, smooth aluminum, the tool's body includes a hand hole and a magnetized strip on the bottom.

060X445 930-9 Torpedo Level.....1-11, \$15.75 ea.; 12-up, \$14.25 ea.



Triple Tap Tool — The 625-32 from Klein is a very useful and unique tool used for cleaning and chasing burred threads. It features a replaceable, chrome-plated 3" steel blade and is threaded to tap three hole sizes (6-32, 8-32 and 10-32) with just this one tool.

060X294 625-32 Triple Tap Tool.....1-5, \$11.50 ea.; 6-up, \$10.50 ea.



Contact Burnishers — Neuses' Model 3-316 burnishers are designed for any type of contact — silver, platinum, gold, palladium, etc. They are non-residual tools that leave no filings, grit, dust or film on contacts and their small size (3" L x .007" thickness) makes them ideal for the occasional user or for working in confined areas.

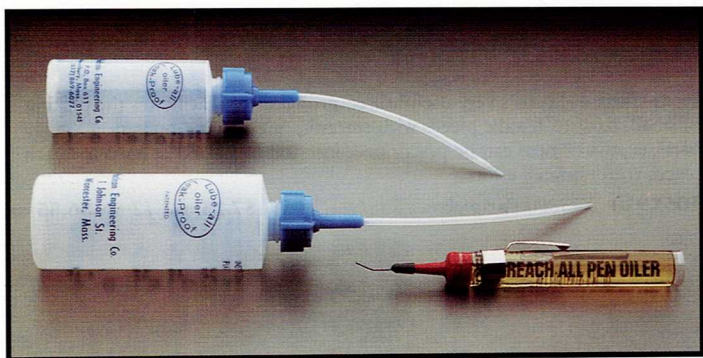
210X316 3-316 Contact Burnishers1-49, \$2.00 ea.; 50-up, \$1.65 ea.



Desoldering Bulb — Ungar's 7805 "Solder-Off" Bulb features a teflon-coated tip for fast, convenient removal of solder. The high heat-resistant tip will not scratch or damage PC boards and other electronic assemblies, making this tool ideal as a repair tool in the field.

094X612 7805 Desoldering Bulb.....1-11, \$9.25 ea.; 12-up, \$8.50 ea.





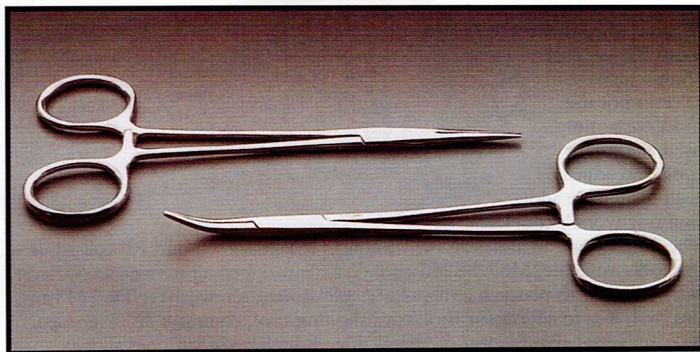
Oilers

The very popular "Lube-all Leak-Proof" plastic oilers are supplied with 5" flexible spouts that make them accessible from almost any angle. Their unique design allows a pin-point of oil to be dispensed with ease. The clear plastic design allows for visible fluid supply. Available in two sizes — 2 ounces and 4 ounces. Supplied empty.

309X200 OL-2 (2-oz. Size)1-11, **\$3.50 ea.**; 12-up, **\$3.00 ea.**
309X400 OL-4 (4-oz. Size)1-11, **4.00 ea.**; 12-up, **3.50 ea.**

Handy and very useful the "Reach-All" pen oiler is a popular tool kit addition. Contains .5 ounces of petroleum based instrument oil packaged in a plastic squeeze vial with a hypo-type spout applicator.

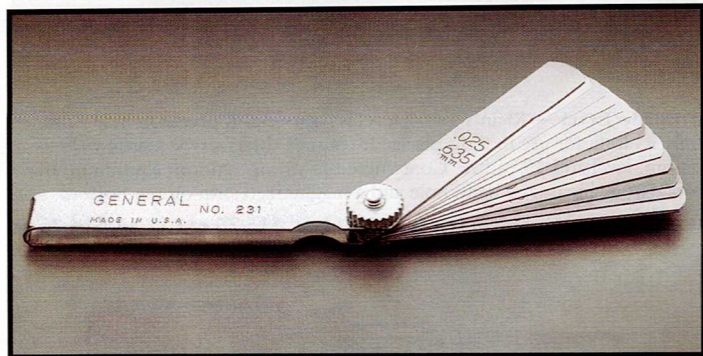
318X400 10-984 Oiler.....1-11, **\$4.00 ea.**; 12-up, **\$3.50 ea.**



Hemostats/Forceps

Often the most used tool in any technician's kit, our stainless steel clamping tools feature box joint construction, serrated jaws for maximum clamping and positive locking blades. These versatile tools have many uses such as heat sink, pick-up tool, clamp and holding fixture for soldering — to name just a few. Available in either standard 5" size or extra-long 6" size (straight or curved jaw).

083X025 HS-5 5" Straight1-11, **\$6.00 ea.**; 12-up, **\$5.25 ea.**
083X035 HC-5 5" Curved1-11, **6.00 ea.**; 12-up, **5.25 ea.**
083X020 HS-6 6" Straight1-11, **7.00 ea.**; 12-up, **6.00 ea.**
083X030 HC-6 6" Curved1-11, **7.00 ea.**; 12-up, **6.00 ea.**



Thickness Gauges

Made of fine quality tempered steel, these feeler gauge sets provide precision accuracy at a reasonable price. Each of the two standard gauges features individual blades that measure 3" x .5" and are made to exacting tolerances, etched on each side with corresponding sizes. The nickel-plated case has a knurled locking nut for precise positioning. Available in three sizes.

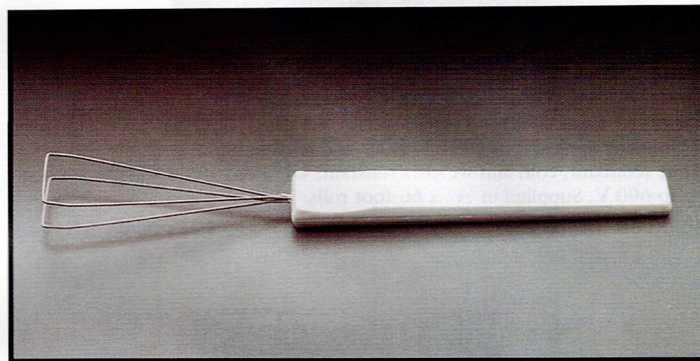
Stock No.	Part No.	Type	No. of Blades	Size/Range	Prices	
					1-11	12-up
046X275	230	Std	26	.0015"-.025"	\$6.00	\$5.40
046X276	231	Std	15	.002"-.025"	4.00	3.60
075X003	OOMM15	Metric	15	.06 mm-.70 mm	8.00	7.25

Parts Boxes

Lightweight Parts Boxes

Ideally suited for use in tool kits, these Lite-Tuff® utility parts boxes are lightweight but virtually unbreakable. By design they provide secure storage for I.C.s, electronic components, fuses or other spare parts. Formed from rugged, shatterproof PETG clear butyrate plastic, these lightweight boxes are strong and amazingly light for their size — the perfect combination for hundreds of uses. We offer these handy boxes in two different sizes and four interior configurations. Every box has hand-riveted stainless steel hinges and those models marked with an * have stainless steel latches, too.

145X008	C1026-0 Box	1-24,	\$ 6.25 ea. ; 25-up,	\$5.60 ea.
145X010	C1026A Box	1-24,	8.75 ea. ; 25-up,	7.90 ea.
145X015	C1026C Box	1-24,	8.50 ea. ; 25-up,	7.65 ea.
145X020	C1026E Box*	1-24,	11.00 ea. ; 25-up,	9.90 ea.
145X048	C1050-0 Box*	1-24,	\$15.00 ea. ; 25-up,	\$13.50 ea.
145X050	C1050A Box*	1-24,	19.90 ea. ; 25-up,	18.00 ea.
145X055	C1050C Box*	1-24,	19.00 ea. ; 25-up,	17.00 ea.
145X060	C1050E Box*	1-24,	26.00 ea. ; 25-up,	23.50 ea.

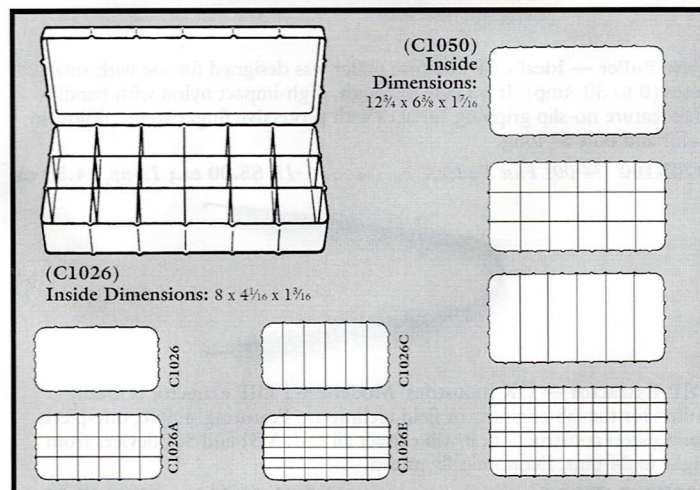


"Caps-Off" Tool

Unique Key Cap Puller

Invaluable tool for the quick and safe removal of keyboard key caps from all computers, typewriters and other office machines. By pushing the metal end over the key cap, slightly twisting and then lifting, the cap comes off cleanly and without any damage. Works on virtually all key caps from .75" single units to 2.5" triple-designed units (and any shaped caps too!). Measures only a little over 6". "Caps-Off" belongs in every tool kit that services computers and office machines. You can finally get the right tool for the job and put an end to struggling with pliers and screwdrivers.

235X100 Caps-Off Tool1-11, **\$5.00 ea.**; 12-up, **\$4.50 ea.**





SD-74 Scrub-It

Solvent Dispenser with Brush

A. Squeeze clean solvent through dispenser brush, then scrub pcb area. Nylon/stainless steel uni-flow control valve dispenses exact amount of solvent needed. No mess. No waste.

Polyethylene bottle is compatible with all common solvents. Long-lasting SD-74 stiff nylon bristle brush.

094X074 SD-74.....1-11, \$9.25 ea.; 12-up, \$8.50 ea.

FD-2 Flux Dispenser

B. Eliminates spills and waste. No other application devices are necessary. Polyethylene squeeze bottle dispenses ONE DROP of liquid resin, flux, oil or solvent through stainless steel hypodermic needle. Perfect for solder/desolder work. One-inch (2.54-cm) long needle prevents evaporation or gummy flux residues.

Self-standing, no-spill bottle holds 2 ounces. Screw top holds needle. Overall height to tip end is 5". Needle ID is .022.

094X002 FD-2.....1-11, \$3.00 ea.; 12-up, \$2.50 ea.

Solvent Dispensers

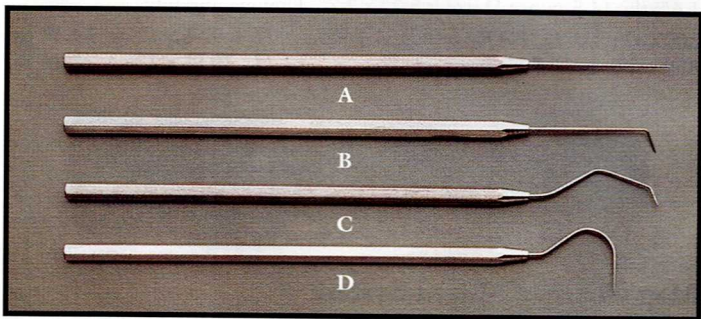
MENDA

C. Menda dispensers are precision instruments, ideal for dispensing solvents and other liquids. Pump units are constructed of the finest stainless steel obtainable to give a lifetime of satisfactory service. The air-tight check valve eliminates evaporation over long periods, yet the light pressure of an applicator or sponge on the dispensing dish pumps solvent to the surface the instant you need it. Choose from three sizes.

083X004 SP-4, 4 oz.1-9, \$9.25 ea.; 10-up, \$8.00 ea.

083X006 SP-6, 6 oz.1-9, 9.25 ea.; 10-up, 8.00 ea.

083X008 SP-8, 8 oz.1-9, 9.25 ea.; 10-up, 8.00 ea.



Test Probers

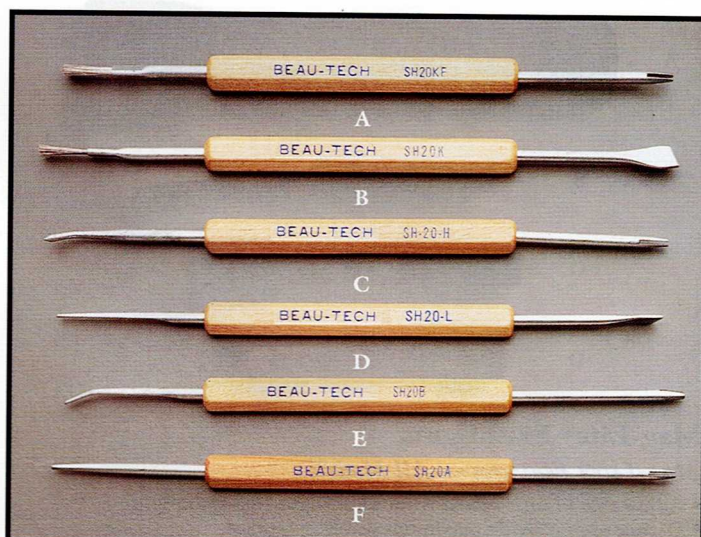
Both hex handles and spring wire tips are made of stainless steel for long-lasting life. Solder will not stick and tips stay surgically sharp.

A. 013X850 SH-1411-49, \$3.25 ea.; 50-up, \$2.75 ea.

B. 013X540 SH-1161-49, 3.25 ea.; 50-up, 2.75 ea.

C. 013X550 SH-1171-49, 3.25 ea.; 50-up, 2.75 ea.

D. 013X660 SH-1231-49, 3.25 ea.; 50-up, 2.75 ea.



Soldering Aids

BEAU TECH

These soldering aids are truly aids. They're designed to help you work faster and more efficiently. Beu Tech manufactures the widest selection of tip styles, providing a versatility not found elsewhere.

Solid Rock Maple Wooden Handles. Only top quality maple finish with a special burn-resistant varnish is used for handles. Wood is more comfortable and attractive to work with. Its hex shape provides a firm grip and won't roll off the bench. Tool ends are of Swedish hardened tool steel tempered to provide a tough, long-lasting working edge.

Hard Satin Chrome Finish. The hard satin chrome finish repels solder even when in contact with flux.

A. 013X260 SH-20KF Brush/Fork Tip

B. 013X250 SH-20K Brush/Scraper

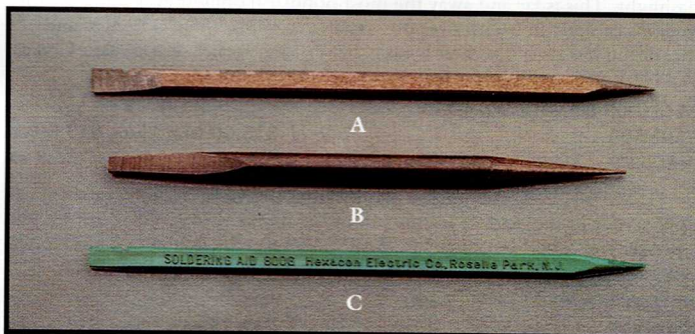
C. 013X220 SH-20H Hook/Fork Tip

D. 013X300 SH-20L Straight Flat Reamer/Scraper

E. 013X050 SH-20B Angled Flat Reamer/Fork Tip

F. 013X010 SH-20A Straight Flat Reamer/Fork Tip

All Models: 1-49, \$3.25 ea.; 50-up, \$2.75 ea.



Spudgers

BEAU TECH

SH-80 Custom Spudger. Flat sided body, tapered flat end with grip notch and blunt cone point. 6" x .25" Vulcanized fibre.

SH-81 Round Spudger. Flat tapered blunt end and long cone point. 5.5" x .31" Vulcanized fibre.

These tools may be used where metallic tools are forbidden because of the danger of magnetic fields or of danger to delicate plating. Use to position components, break solder bridges or probe for loose components.

A. 013X420 SH-801-49, \$4.00 ea.; 50-up, \$3.50 ea.

B. 013X430 SH-811-49, 4.00 ea.; 50-up, 3.50 ea.

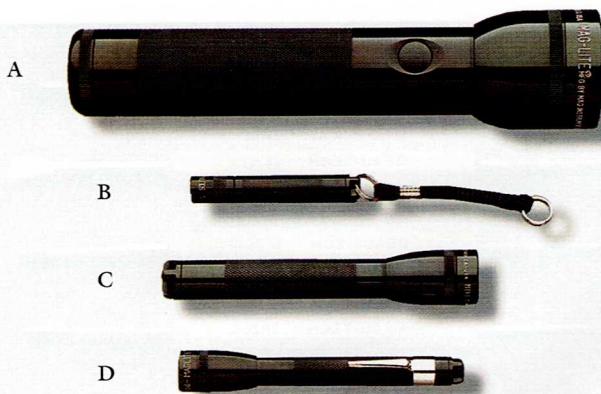
Fiberglass Solder Aid

HEXACON

This tool is designed for inspecting, probing, unsoldering and assembly of printed circuits and other components. It is non-conductive. The Fiberglass Solder Aid helps in the elimination of scratched circuit boards and broken wire strands.

C. 049X280 800G1-49, \$3.75 ea.; 50-up, \$3.25 ea.





Mag-Lite® Flashlights

Mag-Lite® Features — All Models

- Adjustable beam — twist from a spotlight to a floodlight
- O-ring seals provide maximum water resistance
- Anodized aluminum alloy with diamond knurled barrel design
- Explosion tested according to MIL-Std-810C method 511.1
- Limited lifetime warranty!

A. S2D015 — The standard Mag-Lite® flashlight. Built tough enough to last a lifetime, its durability and patented features make it a technologically advanced lighting instrument. Features include: a patented self-cleaning internal switch to help expel inner corrosive build-up; flush sealed rubber thumb button; switch with on, off and blink capability for signaling; and a spare White Star™ Krypton gas lamp. Measures 10" and uses two D batteries (not included).

750X625 S2D015 D-Cell Mag-Lite.....1-11, \$26.50 ea.; 12-up, \$24.00 ea.
750X480 LMSA201 Replacement Bulb.....3.50 ea.

B. K3A012 — Solitaire™ features an extended key lead, allowing the light beam and your key to be used together in the same direction at the same time. Its slim shape fits snugly and comfortably in your pocket or case, weighs next to nothing and measures only 3.25". The Solitaire™ is supplied with the alkaline AAA battery and key lead.

750X400 K3A012 Solitaire Mag-Lite.....1-11, \$9.50 ea.; 12-up, \$8.60 ea.
750X460 LK3A001 Rpl. Bulbs (2/cd.).....2.25 ea.

C. M2A012 — Legendary Mini Mag-Lite AA™ is the ideal personal flashlight. This is far and away the most popular flashlight ever sold — with millions of them in use all over the world. Weighing about 2 ounces and measuring less than 6 inches, it easily fits in your pocket or tool bag. Comes in a black presentation box and uses two AA batteries (not included).

M2A012 AA Mini Mag-Lite
750X500.....1-11, \$15.00 ea.; 12-up, \$13.50 ea.
750X470 LM2A001 Rpl. Bulbs (2/cd.).....2.25 ea.

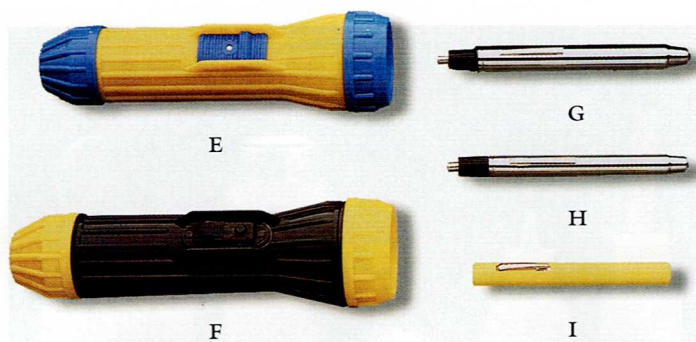
D. M3A012 — The smaller Mini Mag-Lite AAA™ is perfect for a quick light source in the field. It features all of the standard Mag-Lite qualities plus a pocket clip. The Mini Mag-Lite AAA™ measures 5", comes in a black presentation box and uses two Alkaline AAA batteries (included).

M3A012 AAA Mini Mag-Lite
750X525.....1-11, \$12.75 ea.; 12-up, \$11.50 ea.
750X475 LM3A001 Rpl. Bulbs (2/cd.).....2.25 ea.

Mini Maglite® Combo Pack

You get a high-intensity beam from flood to spot with a twist of the wrist. The Mini Maglite® features extra long lamp life and efficient power usage. It converts quickly to freestanding candle mode. Rugged, machined aluminum construction with knurled design, it is anodized inside and out for optimum corrosion resistance. Also it is water and shock resistant. Lens holder/anti roll device holds lens and helps prevent flashlight from rolling. Colored lens set helps maintain night vision. Clear replacement lens included. Kit also includes spare lamp inside tail cap, wrist lanyard, pocket clip, two AA cell Energizer® alkaline batteries and operating instructions. Lifetime warranty.

750X511 M2A01C Mini Maglite.....1-11, \$17.00.; 12-up, \$15.50 ea.



Standard Flashlights and Penlights

E. 918N — Industrial flashlight made of high-density polypropylene is shock, water and corrosion resistant. It features heavy-duty switch, parabolic spot reflector and super-bright Krypton bulb which is 70% brighter than ordinary flashlight bulb. Measures 8.25". Uses two D cells (not included).

248X470 918-N Heavy Duty Flashlight.....1-11, \$6.50 ea.; 12-up, \$5.50 ea.

F. 911 — Safety-designed, completely waterproof flashlight approved for all hazardous areas containing combustible plastics, hazardous vapors and gases. Includes three-position switch. Class II, Group G and Class I, Group C and D approved. Measures 8.25". Uses two D cells (not included).

248X460 911 Safety Approved Flashlight..1-11, \$10.75 ea.; 12-up, \$9.25 ea.

G. 20 — One of our most popular. Model 20 triple chrome-plated penlight features a reliable push-button switch, pocket clip and attractive slim profile. Measures 5.5" and uses two AA batteries (not included).

248X020 20 Penlight (AA).....1-11, \$5.75 ea.; 12-up, \$5.00 ea.

H. 30 — Our smallest standard penlight. Model 30 triple chrome-plated penlight features a push-button switch, pocket clip and attractive slim barrel design. Measures 5.5" and uses two AAA batteries (not included).

248X030 30 Penlight (AAA).....1-11, \$5.75 ea.; 12-up, \$5.00 ea.

I. PD-1 — Handy disposable penlight is ideal as a quick source of light for field test work. Pocket clip doubles as an automatic off/on switch. Should be in every tool kit. Measures 4.75".

250X125 PD-1 Disposable Penlight.....1-24, \$2.75.; 25-up, \$2.25 ea.

Flash Grip Flashlight Holder

Flash Grip is an adjustable magnetic flashlight holder. The heat-treated spring steel top clip with rugged plastic coating protects the flashlight. Metal parts are coated with zinc phosphate for rust and corrosion resistance. Powerful, permanent ceramic magnet is zinc plated for corrosion resistance and adheres to any flat ferrous metal surface. Spring-loaded ball enables smooth adjustment, then holds light exactly where you point it. Fully adjustable vertically, pivots 70° and rotates 360°. Strong, ultra-high-impact polycarbonate (AA size) or polypropylene (D size) housing built to last. The 2.5-ounce AA size is 3" x 1.4"; the 14.5-ounce D size is 5.2" x 2.7". Lifetime warranty.

300X821 0071121-B Flash Grip, AA Size....1-11, \$ 9.95.; 12-up, \$ 9.15 ea.

300X805 0021-B Flash Grip, D Size.....1-11, 19.95.; 12-up, 18.35 ea.



Mag Charger™ Light System

Rechargeable flashlight system is the state-of-the-art in hand-held illumination. With all the features of the standard Mag-Lite® plus a five-cell (½D) battery stick, it recharges up to 1000 times! The recharging unit comes ready to mount anywhere with a detachable mounting bracket, and it can operate in a vehicle or on a house current. You can expect 1-1.5 hours per charge. The system includes: rechargeable Mag Charger™, black Mag-Lite flashlight, 12-volt and 110-volt power cord, charger unit and battery pack. Measures 12.75" and weighs about 1 pound (31 ounces with the battery pack).

750X600 RX1019 Mag Charger.....1-11, \$139.00 ea.; 12-up, \$125.00 ea.





Conduct-A-Lite INSPECTION KIT

Conduct-A-Lite Kit #5

Inspection Light Kit

- For hard-to-see, hard-to-reach areas
- Handle with two light conductors and lighted mirror

Conduct-A-Lite is ideal for industrial inspectors, electrical technicians and do-it-yourselfers. Use this unique lighting tool to inspect hard-to-see and hard-to-reach areas. It is ideal for inspecting components and finding part numbers on chassis.

The bottom portion of this tool is machined aluminum while the light conductors are plastic. A focused lens bulb reflects off the optical glass mirror like a dentist's light. This handy tool features a precision aluminum light which uses two AA batteries (not supplied). Kit #5 also includes a 6-inch straight rigid lucite conductor, a 4-inch curved rigid lucite conductor plus a chrome-plated and distortion free clip-on mirror. The kit comes packaged in a plastic carrying case.

025X330 Kit #5 Conduct-A-Lite1-5, \$19.75 ea.; 6-up, \$17.95 ea.



Master Light™ Roto Beam™

Omni-Directional Flashlight

- Quality, reliable light source
- Unique rotary design allows head to swivel in any direction

This clever little flashlight is great for hands-free operation. The swivel head rotates 360° for multi-directional use. You will find the Master Light™ Roto Beam™ helpful in a wide variety of applications. Flashlight features include variable focus, versatile pocket clip, comfortable fluted grip and twist on/off tail cap with lanyard fixture.

The durable polyamide body is black in color. It uses a standard replacement bulb. Two AA alkaline batteries (not included) are required for operation. Engineered and manufactured in the U.S.A.

132X610 8400 Master Light Roto Beam...1-11, \$14.25 ea.; 12-up, \$13.00 ea.



MACHINERY PRODUCTS

Master Light™ Power Beam™

Machined Aluminum Flashlight

- Features power, quality and reliability
- 50% brighter than other AA machined flashlights

The Master Light™ Power Beam™ lives up to its name. It is up to 50% brighter than other AA machined flashlights. Easily adjust the beam from flood to spot focus for lighting versatility. Features include precision machined aircraft aluminum body, durable and protective anodized finish, laser engraved head and vise-like knurled grip.

This water-resistant and shockproof flashlight uses standard flashlight bulbs. Choose from three attractive colors: red, black and blue. Each Power Beam is powered by two AA alkaline batteries. Designed and manufactured in the U.S.A. Limited lifetime warranty.

132X720 8903 Red Power Beam Light...1-11, \$10.00 ea.; 12-up, \$9.00 ea.

132X830 8901 Black Power Beam Light...1-11, 10.00 ea.; 12-up, 9.00 ea.

132X940 8904 Blue Power Beam Light...1-11, 10.00 ea.; 12-up, 9.00 ea.



Kodak Supralife Batteries

Kodak Supralife Batteries provide peak alkaline performance and consistently deliver long life. They are 99.999% mercury free. Each superior-quality battery is double sealed to prevent leakage. Choose from six different sizes to meet your needs. Longlife guarantee program.

Stock No.	Part No.	Type Cell	1-47	Prices 48-191	192-up
645X405*	KD-2	D	\$3.90	\$3.50	\$2.95
645X025	K-9V-1	9 Volt	3.90	3.50	2.95
645X410*	KC-2	C	3.90	3.50	2.95
645X415*	KAA-2	AA	2.70	2.40	2.10
645X425*	K3A-2	AAA	2.70	2.40	2.10
645X400	KN	N	1.50	1.35	1.20

*Packaged two per card — price is per package



Kodak Ultralife® 9-Volt Battery

Lasts Four Times Longer

The Ultralife® 9-Volt Lithium Power Cell from Kodak is an amazing battery that lasts up to four times longer than premium alkaline batteries. It is mercury, cadmium and lead free. The premium 9VLP-FP is the only 9-volt battery available with a 10-year shelf life.

Stock No.	Part No.	Type Cell	1-47	Prices 48-191	192-up
647X900	U9VL-FP	9 Volt	\$7.50	\$6.90	\$6.50



PROHEAT® Heat Guns

Compact, ergonomically-designed Lexan® housing, enclosed ceramic heating element and wrap-around air intake provide lightweight, easy-to-use flameless heat source for working with shrinkable packaging materials, spot-drying paint, bending plastics/laminates and activating adhesives. Features built-in hand and switch guard with oil-resistant grounded Neoprene three-wire cordset.

A dc permanent magnet motor is compatible with all electrical frequencies. Air is drawn in in an upright position. Airflow of 15 CFM at 3650 FPM meets requirements of most materials. Nozzle opening diameter is 1.3". Includes hanging loop for assembly line use. Cord length is 6 feet.

The PH-1100 has two temperature settings. Versatile PH-1200-1 offers self-limiting variable temperature control. Dial any temperature from ambient to 1050° F (565° C). Solid-state electronic thermostat control maintains lockable pre-set temperature and prevents heat back-up or overheating when airflow is restricted. PH-1200-1 includes bench stand, reducer and specialty connector attachment. Each 1.7-pound unit is 8.25" x 3" x 7.3".

Part No.	F°	C°	Volts	Amps	Watts	Hz
PH-1100	570°	299°	120	6	750	
	1050°	565°		12	1500	50-400
PH-1200-1	1050°	565°	120	12 Max	1500 Max	50-400

PH-1100 PROHEAT® Heat Gun

066X8501-5, \$72.00 ea.; 6-up, \$66.00 ea.

PH-1200-1 PROHEAT® VARITEMP® Heat Gun

066X8551-5, \$155.00 ea.; 6-up, \$144.00 ea.

AMPSULATION® Heat-Shrink Tubing Kit

Use this 91-piece heat-shrink tubing kit for field service, production assembly plus wire and cable repair. Insulate and provide strain relief or environmental protection. Repair and splice, bundle discrete plus mark and color wire and cable. Tubing comes in expanded form. A heat gun at 250° F (121° C) or greater causes tubing to recover to original predetermined diameter. Thin-wall tubing forms tight-fitting mechanical bond on objects within recovery range. As dual-wall tubing shrinks, insulation adhesive liner melts and flows to seal and encapsulate components or splices contained within.

You get 73 pieces of thin-wall tubing in black, white, clear, blue, red and yellow. Tubing is 3/32" to 1/2" in diameter by 4" long and made of an extruded, irradiated, thermally stable, modified polyolefin material. It will not cold flow or melt when used in -67° F to 175° F (-55° C to 135° C) operating temperature range. Includes 18 black dual-wall tubing pieces 1/8" to 1" in diameter by 4" long. Radiation crosslinked polyolefin material is rated for continuous operation at 125° C. The 1-pound plastic case is 6.5" x 10.9" x 1.75". Reference literature included.

194X411 607243-1 Tubing Kit1-9, \$37.50 ea.; 10-up, \$34.00 ea.

Heat Gun 6966C

The 6966C is widely accepted as the best buy in a modestly priced, general-purpose heat gun. It has proven itself in production plants, laboratories and service shops for such applications as encapsulation, reflow soldering, epoxy curing, shrink-film packaging, cooling and drying components, expanding frozen fasteners, hot-melt adhesive reflow and vinyl repairs. It is safe and effective for shrink tubing applications with all polyvinyls, olefins, TFE and other high-temperature heat-shrink materials.

Ruggedly constructed at only 13 ounces, 6966C is comfortable to



MASTER

Deluxe Heat Guns

Master has long been recognized as the industry standard for heavy-duty, industrial heat tools. With features like temperatures up to 1000° F and adjustable air volume, these Deluxe Heat Guns are the perfect solution for almost any electronic/industrial job including shrink tubing, desoldering, heat shrink packaging, paint stripping, activating/curing epoxies and adhesives, etc.

Each of these heat guns has a rugged, die-cast aluminum housing with externally replaceable carbon brushes, three-wire cordset and adjustable rubber-backed base that permits a full 90° rotation of the gun for benchtop use.

Stock No.	Part No.	Temp at Nozzle		Amps	Prices	
		F°	C°		1-5	6-up
066X461	HG-201A	200-300°	93-149°	5	\$99.00	\$91.50
066X450	HG-301A	300-500°	149-260°	12	99.00	91.50
066X501	HG-501A	500-750°	260-399°	14	99.00	91.50
066X751	HG-751B	750-1000°	399-538°	18	99.00	91.50

Accessories

Shrink tubing attachment for tubing up to 2" O.D.

066X170 A-170-HG\$18.00 ea.

Pinpoint heat attachment direct 1/4" heat

066X110 51309\$20.00 ea.

MASTER

"Master Mite"

The "Master Mite" Heat Gun is a compact flameless heat tool for heat shrinking and countless other industrial applications. Its light weight and perfect balance afford the operator effortless handling and positive control. Three interchangeable nozzle heating elements provide the ultimate in versatility. Silver is standard and used for most shrinkables. Blue (for Mylar) and Black (for Teflon) nozzles are optional. Change or replace snap-in nozzles in seconds to eliminate costly downtime.

066X008 10008 Heat Gun1-5, \$69.00 ea.; 6-up, \$64.00 ea.

066X060 40060 Deflector Adapter8.00 ea.

066X061 40061 Pin Point Adapter17.50 ea.

Replacement Heating Elements

Stock No.	Part No.	Color	Temp.	1-5	6-up
066X012	20012	Blue	500° F	\$25.00	\$22.50
066X013	20013	Silver	650° F	25.00	22.50
066X014	20014	Black	800° F	25.00	22.50



grip and easy to use. Handle remains cool to the touch even after extended use. There is a convenient three-way switch at the trigger position. A 3/8" air stream from nozzle directs heat to exact area desired. Air flow temperature at nozzle reaches approximately 750° F to 800° F in seconds. When not in use, unit may be suspended over a work area by its suspension ring.

Specifications include temperature range of 750°-800° F and 120 volts ac only. Includes three-wire grounded plug, 6-foot cord set, suspension ring, shrink tubing reflectors, reducing baffle and precision reflector.

094X575 6966C Heat Gun1-5, \$116.00 ea.; 6-up, \$110.00 ea.





Standard Panavise 301

Combination unit includes #300 standard base and #303 standard head. This best selling standard head opens to 2 1/4" by turning the heavy-duty adjusting screw.

- 026X301** 301 Vise Combo.....1-5, \$44.00 ea.; 6-up, \$40.50 ea.
026X300 300 Std. Base Only.....1-5, 21.00 ea.; 6-up, 19.50 ea.
026X303 303 Std. Head Only.....1-5, 24.00 ea.; 6-up, 22.00 ea.



350 Multi-Purpose Work Center

The Self-Centering, Extra Wide Opening Head (Model 376) allows you to work on objects up to 9 inches in size as well as tiny objects that are quite often hard to hold. In addition, this new work center gives you a Standard Base (Model 300) that tilts, turns and rotates to any desired work position and a Tray Base Mount (Model 312) with six individual trays to hold small parts and tools right where you want them.

- 026X350** 350 Work Center.....1-5, \$80.00 ea.; 6-up, \$74.00 ea.
026X376 376 Wide Head Only.....1-5, 40.00 ea.; 6-up, 37.00 ea.
026X300 300 Std. Base Only.....1-5, 21.00 ea.; 6-up, 19.50 ea.
026X312 312 Tray Base Mount Only.....1-5, 22.00 ea.; 6-up, 20.50 ea.



S333 Rapid Assembly Circuit Board Holder

This circuit board holder features an eight-position rotating adjustment and six positive lock positions in the vertical plane. Crossbars are available up to 30 inches in length to hold circuit boards up to 28 inches in width. Extra arms can be added for dual or multiple board holding. Spring loaded, the 333 features tilt angle adjustment, height adjustment and quick board rotation for easy component insertion and soldering.

- 026X333** 333 Board Holder.....1-5, \$67.00 ea.; 6-up, \$62.00 ea.



Wide Opening Panavise 396

Combination unit includes #300 standard base and #366 wide opening head. The contoured neoprene jaws open a full 6".

- 026X396** 396 Vise Combo.....1-5, \$49.50 ea.; 6-up, \$45.50 ea.
026X300 300 Std. Base Only.....1-5, 21.00 ea.; 6-up, 19.50 ea.
026X366 366 Wide Head Only.....1-5, 30.00 ea.; 6-up, 27.50 ea.
026X380 380 Vacuum Base (Inset).....1-5, 34.00 ea.; 6-up, 31.25 ea.

Not Pictured:

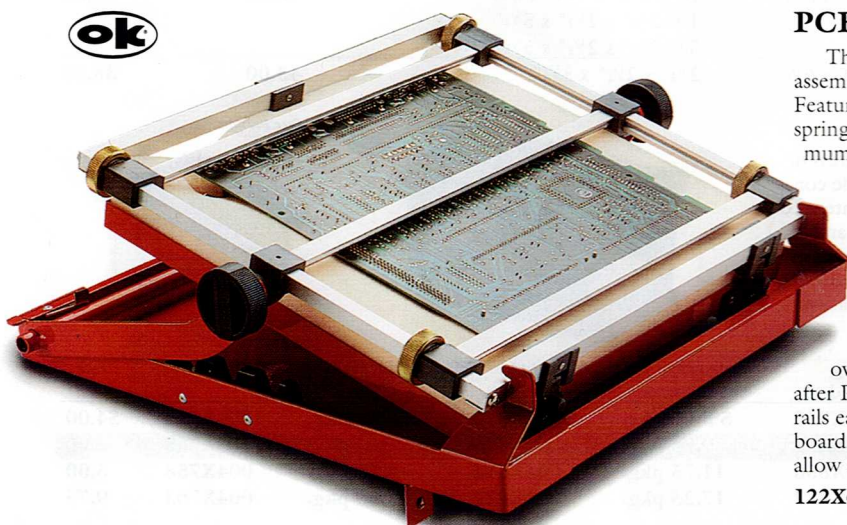
- 026X308** 308 Heavy Mounting Base.....1-5, \$25.00 ea.; 6-up, \$23.00 ea.
026X311 311 Bench Clamp.....1-5, 38.50 ea.; 6-up, 35.50 ea.

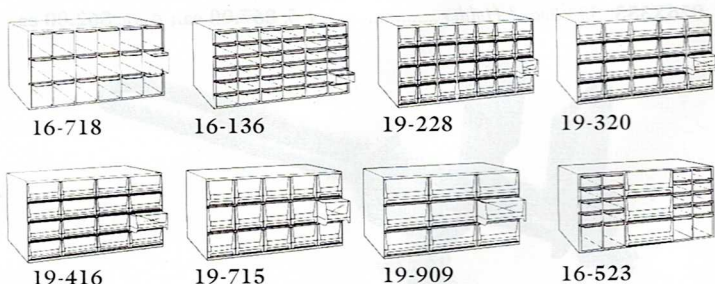
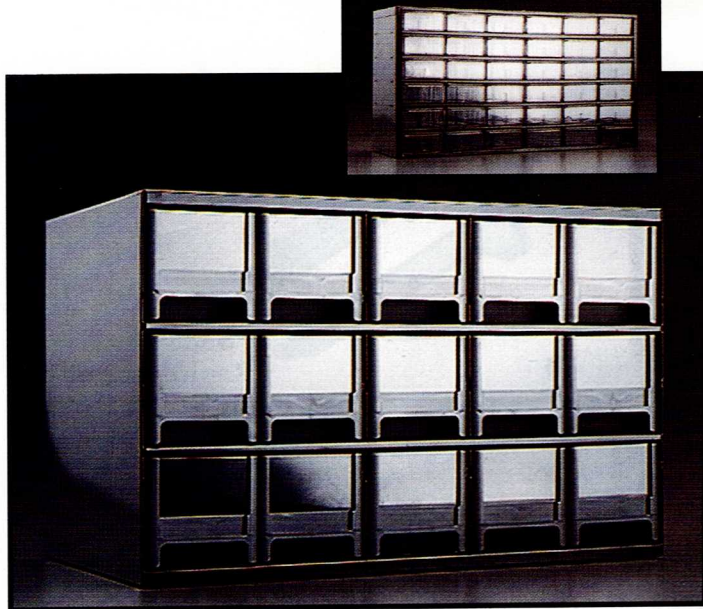
PCBH-60 PCB Holder

This printed-circuit board holder greatly increases productivity in pcb assembly and repair. It is ideal for production and prototyping applications. Features include various board size accommodation, angled board position, spring-loaded guide rails and adjustable foam-lined retaining cover. Maximum board size without center bar is 10.6" x 8.6". The frame rotates a full 360 degrees. Holders are constructed of rugged steel components for durability as well as stability in use. The steel-backed foam cover opens (from either end) to expose components, testing or assembly work.

Fix the PC jig on the bench by screws or clamps with closed foam cover. Open this cover by the front push-button. Its height adjusts to component's dimensions (up to a max 30-mm height). Parts are easily separable by removing interlocks. Turn PC Holder over by holding on side knobs. Self adjustment to base frame is possible after PC holder is turned over and placed in fixed operating position. Sliding rails easily set and lock. Adapting springs allow in and out operation on pc board without moving rail from preset position. Central bar easily locks to allow multiple board assembly.

- 122X630** PCBH-60 PCB Holder.....1-5, \$190.00 ea.; 6-up, \$171.00 ea.





Akro Mils Modular Cabinets

Small parts inventories can be neatly stored, consolidated and organized with Akro Mils' heavy-duty Series 1900 Modular Cabinets. Each cabinet is made of strong welded steel to provide years of service. Tough plastic drawers feature transparent windows to let you view their contents instantly. If additional storage space is needed, simply stack cabinets like building blocks! *Two Series 1900 Cabinets fit perfectly side by side on standard 36" shelving.*

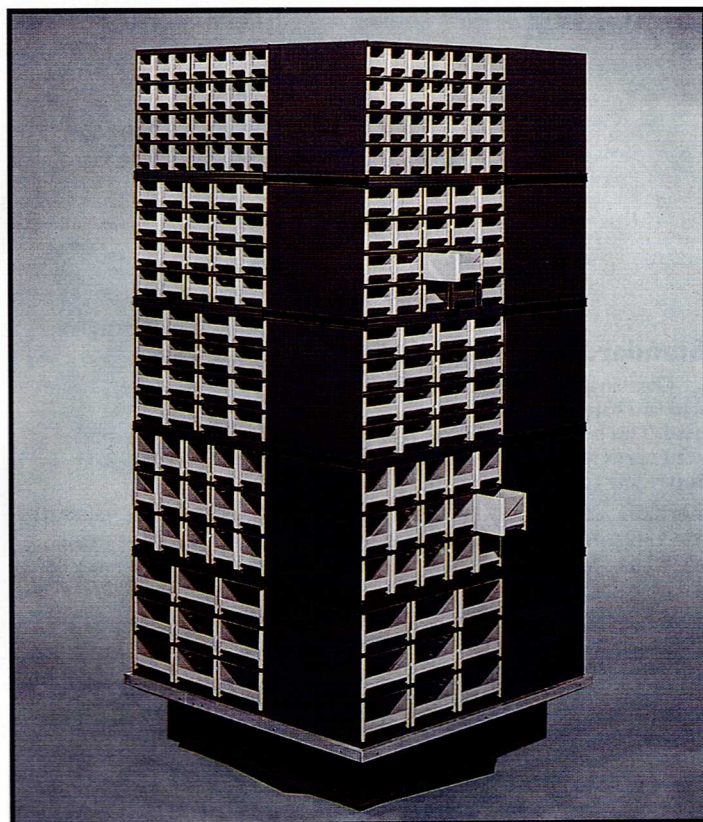
Economy Plastic Frame Cabinets (16-136, 16-523 and 16-718) feature one-piece, high-strength ABS copolymer frames with textured gray finish. Crystal styrene dividable drawers make contents visible. Affordable plastic frames can be wall mounted with keyhole slots. Pedestal bases and recessed tray tops allow for stable stacked arrangements. *Shipped surface freight.*

Stock No.	Part No.	Quantity of Drawers	Overall Dimensions W x H x D	Drawer Size W x H x D	Prices	
					1-5	6-up
004X325	19-228	28	17" x 11" x 11"	2 $\frac{3}{16}$ " x 2 $\frac{1}{8}$ " x 10 $\frac{9}{16}$ "	\$77.00	\$71.00
004X328	19-320	20	17" x 11" x 11"	3 $\frac{3}{16}$ " x 2 $\frac{1}{8}$ " x 10 $\frac{9}{16}$ "	77.00	71.00
004X332	19-416	16	17" x 11" x 11"	4" x 2 $\frac{1}{8}$ " x 10 $\frac{9}{16}$ "	77.00	71.00
004X336	19-715	15	17" x 11" x 11"	3 $\frac{3}{16}$ " x 3 $\frac{1}{8}$ " x 10 $\frac{9}{16}$ "	77.00	71.00
004X340	19-909	9	17" x 11" x 11"	5 $\frac{3}{16}$ " x 3 $\frac{1}{8}$ " x 10 $\frac{9}{16}$ "	77.00	71.00
004X260	16-136	36	18 $\frac{1}{4}$ " x 8 $\frac{5}{8}$ " x 6 $\frac{3}{8}$ "	2 $\frac{3}{4}$ " x 1 $\frac{1}{4}$ " x 5 $\frac{3}{4}$ "	43.00	38.50
004X265	16-523	23	18 $\frac{1}{4}$ " x 8 $\frac{5}{8}$ " x 6 $\frac{3}{8}$ "	16 @ 2 $\frac{3}{4}$ " x 1 $\frac{1}{4}$ " x 5 $\frac{3}{4}$ " 4 @ 2 $\frac{3}{4}$ " x 2 $\frac{1}{2}$ " x 5 $\frac{3}{4}$ " 3 @ 5 $\frac{3}{8}$ " x 2 $\frac{1}{2}$ " x 5 $\frac{3}{8}$ "	43.00	38.50
004X270	16-718	18	18 $\frac{1}{4}$ " x 8 $\frac{5}{8}$ " x 6 $\frac{3}{8}$ "	2 $\frac{3}{4}$ " x 2 $\frac{1}{2}$ " x 5 $\frac{3}{4}$ "	43.00	38.50

Akro-Grid Dividable Containers

Akro-Grids provide maximum versatility in a standard work-in-progress or transfer container. Long and short intersecting dividers let you subdivide containers into separate compartments as small as 1.25" square to hold contents of many shapes and sizes. High-density polyethylene resists most solvents and chemicals. Injection-molded for uniform wall thickness and resistance to stress cracks. Ribbed design provides added strength. Choose from four stackable sizes in gray with two choices of dividers to suit a wide variety of applications. Clear plastic dust cover lids keep contents clean yet visible.

Container No.	Overall Dimensions L x W x D	Prices		Long Dividers	Prices 6/Pkg.	Short Dividers	Prices 6/Pkg.	Lids	Price Each
004X756	10 ⁷ / ₈ " x 8 ¹ / ₄ " x 5"	\$5.50	\$4.70	004X830	\$ 5.00 pkg.	004X810	\$ 5.00 pkg.	004X754	\$4.00
004X760	16 ¹ / ₂ " x 10 ⁷ / ₈ " x 6"	9.75	8.50	004X836	9.75 pkg.	004X816	8.00 pkg.	004X758	6.00
004X761	16 ¹ / ₂ " x 10 ⁷ / ₈ " x 8"	11.50	9.95	004X838	11.75 pkg.	004X818	8.75 pkg.	004X758	6.00
004X765	22 ³ / ₈ " x 17 ³ / ₈ " x 8"	18.75	16.25	004X842	17.25 pkg.	004X822	15.50 pkg.	004X763	9.75



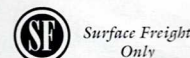
Storage-Go-Round

Rotating Customized Storage Center



Unique rotating storage system lets you organize thousands of items — up to 1000 pounds of parts and tools in less than 1 square yard of floor space. It provides convenient fingertip access to as many as 560 drawers utilizing up to 20 Series 19 cabinets. Model 20 Storage-Go-Round consists of 31" W x 60" H x 31" D 98-320 weighted base plus five each of 19-228, 19-320, 19-416 and 19-909 cabinets. Or order the weighted base separately plus up to 20 of any 19-Series cabinets to customize your own system!

004X500 Model 20 Std. Storage-Go-Round System\$1375.00 ea.
004X970 98-325 Weighted Base Only215.00 ea.



DREMEL

Dremel Moto-Tools®

Multi-purpose power tools grind, polish, carve, engrave, sand, cut, rout, drill, deburr, sharpen, shape and more. With attachments and accessories, they do hundreds of special jobs around the shop or plant with precision and accuracy. Use these popular, indispensable tools for prototyping, building models and on the production line. Choose from two versions to suit your needs.

A. 3955 Moto-Tool® Kit: Includes Model 395 variable speed Moto-Tool (5000-30,000 rpm), 72-piece accessory/bit assortment kit and deluxe storage/carrying case. Includes over \$60 worth of cutoff wheels, sanding discs, drills, grinding stones, high-speed cutters and polishing wheels. Compact yet powerful Moto-Tool utilizes rugged ball bearing construction, double-insulated motor and 6-foot 12-wire coiled power cord.

036X885 3955 Complete Kit.....1-3, \$127.50 ea.; 4-up, \$115.00 ea.
036X395 395 Moto-Tool Only.....1-3, 100.50 ea.; 4-up, 90.50 ea.

B. 332 Moto-Flex® Tool: Unique variable speed, flexible shaft version of 395 tool above. It features three-position speed selector switch with variable speed override and 34" thermo-plastic rubber covered flex-shaft with spring-type strain reliefs on both ends. Versatile tool's lightweight handpiece and finger-tip control allow easy access to hard-to-reach areas. The 332 includes detachable 360° swivel base, wallhanger device, adjustable collet and collet wrenches.

036X332 332 Flex-Shaft Tool.....1-3, \$148.00 ea.; 4-up, \$133.50 ea.

C. 7700 MultiPro™ Cordless Kit: This 7.2-volt multi-purpose cordless tool with rugged, shatter-resistant housing provides versatility anywhere. Two-speed slide switch means easy access to 7500 and 15,000 rpm settings. Housing is tapered for comfortable fingertip control. A removable, inter-

changeable, three-hour battery pack with LED charging indicator assures battery is being charged. This light, compact, easy-to-handle tool features ball bearing drive shaft with shaft lock for easy bit changing. Includes 1/8" knurled collet nut and powerful motor.

The kit includes 25 accessories and 175+ USES guide book. You get 1/8" diameter drill bit, high-speed cutter, two mandrels, bristle brush, drum sander, three sanding bands, six cut-off wheels, two sanding discs, four felt polishing wheels, dressing stone, emery polishing wheel, felt polishing wheel, aluminum oxide grinding stone and silicon carbide grinding stone. Convenient storage case provides ample room for tool, charger, extra battery pack and accessories/bits.

036X895 7700 MultiPro Cordless Kit.....1-3, \$75.00 ea.; 4-up, \$67.50 ea.

DREMEL

Moto-Tool® Attachments

D. 212 Drill Press: Converts the Moto-Tool into a precision drill press with all the convenience and features of regular sized ones. It features rack and pinion feed handle, calibrated depth shaft and 6" x 6" slotted base that accommodates hold-down clamps.

036X212 212 Drill Press.....\$53.50 ea.

E. 230 Router Attachment: Converts Moto-Tool into miniature router. Ideal attachment for edging, shaping, grooving, recessing and freehand routing. Features calibrated depth adjustment, edge guide, adjustable fence (0-3.75") and .13" straight router bit.

036X229 230 Router Attachment.....\$32.00 ea.

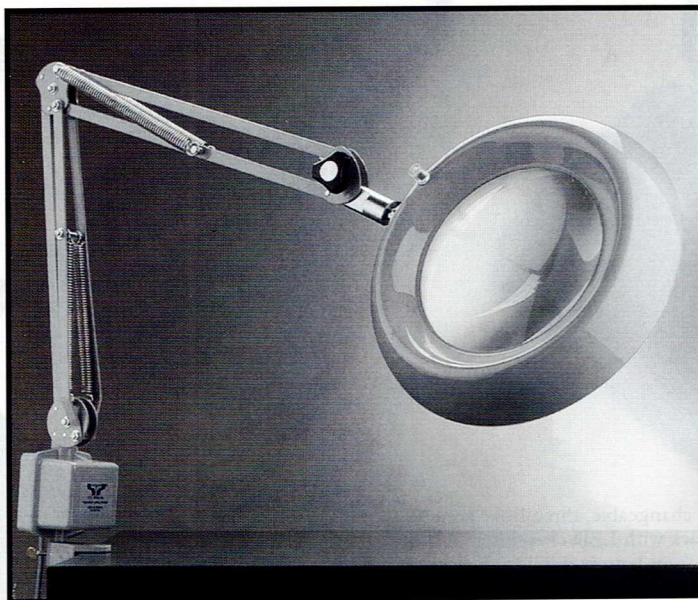
F. 2217 Holder and Base: Specially designed attachment holds Moto-Tool firmly in any desired position so operator can use both hands to control workpiece. Comes complete with holder assembly, post and adjustable base.

036X873 2217 Holder and Base.....\$40.00 ea.

G. 90349 Accessory Set: Replacement accessory set for 395 or 332 Moto-Tools described above. This 34-piece kit includes cutoff wheels, sanding discs, drills, grinding stones, high-speed cutters, polishing wheels and router bits.

036X977 90349 Accessory Set.....\$45.00 ea.



**OC WHITE**

The Big Eye

Magnifying Lamp with 7.5" Lens and 13" Focal Length

The Big Eye represents a major breakthrough in magnifying lamp technology. By utilizing a 7.5" optically ground and polished lens, it is possible to view a 12" pcb in its entirety! This is a huge improvement over previously existing lamps, and consequently the Big Eyes have gained rapid approval from quality control departments all over the country.

These lamps are excellent tools for use in the inspection of production work, for prototyping sub-miniature assemblies and for all Q.C. applications. Their 7.5", full 13" focal length lens and cool white bulb combine almost to eliminate inspection mistakes and eye strain. Big Eye Model 52400 is a three-diopter lamp that has 36" long, deluxe, heavy-duty arms. It comes in a standard medium gray epoxy-type finish that permits a maximum amount of shadow-free illumination to reach the work area. Also comes complete with an OSHA approved three-conductor cordset and a 32-watt cool white bulb. An optional Glare-Free Bulb may be purchased separately.

195X049 52400 Big Eye Lamp1-5, \$357.00 ea.; 6-up, \$322.00 ea.
195X013 13363 GF Optional Glare-Free Bulb40.00 ea.

**DAZOR**

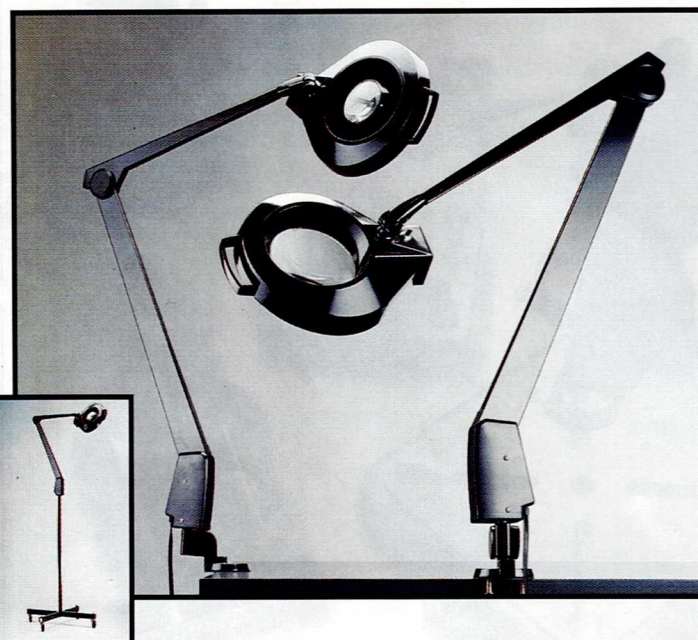
Model 8ML-Series Magnifier Flex

Fluorescent or Incandescent Lighting

No need to do without the benefits of illuminated magnification any longer. The Magnifier Flex by Dazor Manufacturing Corp. introduces you to the comforts of illuminated magnification at a remarkably low price! Choose from two models: the Magnifier Flex 8ML100 incandescent and the Magnifier Flex 8ML104 fluorescent lamps. Each provides an excellent light source that is reflected at the proper angle to enhance and highlight object detail, which can be crucial for many inspection tasks. The 5-inch glass magnifying lens produces sharp images, and the three-diopter lens magnifies an object by 75% at a distance of 13 inches.

Each 8ML-Series model features a tough, durable flexible arm with a total reach of 30 inches. Arms adjust easily and stay in position with a convenient C-clamp mounting bracket. Midnight black color. Replacement bulbs may be ordered separately.

260X300 8ML-100 Incndscnt. Magnifier...1-11, \$74.00 ea.; 12-up, \$67.00 ea.
260X810 40T10/IF Repl. Incandescent Bulb3.00 ea.
260X325 8ML-104 Flrescent. Magnifier...1-11, \$93.50 ea.; 12-up, \$84.50 ea.
260X820 13W-41 Repl. Fluorescent Bulb10.00 ea.



8MC-Series Circline Illuminated Magnifiers

Lighted Magnification for Viewing Small Details

Stylish Dazor 8MC-Series Illuminated Magnifiers cast an even glow on your task for optimum brightness and accuracy. They reduce eyestrain and fatigue by combining the two key factors in aiding vision — light and magnification. Each 5-inch crown optical glass lens is crystal clear and distortion free. The all-metal head has a sturdy, convenient handle. A 22-watt circline fluorescent cool white light source provides shadow-free lighting. The floating arm lets you position it with the touch of a finger. It stays in place so hands remain free. All-metal interlocking arm channels provide extra strength. A precision, counterbalanced spring is hidden near the adjustable clamp-on base. Mounts on any vertical, horizontal or slanted surface. Adjustments are made swiftly with a comfortable, easy-to-grasp knob. The IV-pivot can be inserted into a floor stand. Each lamp has a bonderized, oven-baked finish of high solid, black paint.

Choose from three models. The 8MC-200 is the three-diopter, +75% magnification model. Order the 8MC-200-5 for the five-diopter model with +125% magnification. Choose the 8MC-200-4X for precise inspection. This four-power, 16-diopter lens system meets MIL-STD-2000. The black 1050 Floor Stand with caster base is optional. Five-year warranty covers electrical components and mechanical operation but not tubes and bulbs.

260X233 8MC-200 (+75%)1-5, \$158.00 ea.; 6-up, \$143.00 ea.
260X255 8MC-200-5 (+125%)1-5, 182.00 ea.; 6-up, 164.00 ea.
260X244 8MC-200-4X Four-Power1-5, 243.00 ea.; 6-up, 219.00 ea.
260X750 1050 Caster Floor Stand85.00 ea.



KFM-Series Industrial-Grade Magnifiers

The KFM-Series illuminated magnifying lamps are recognized the world over as the industry standard lamps that provide the magnification power that's wanted with the illumination that's needed. For larger than life illumination and where accuracy and visual clarity are critical, these Luxo Magnifiers are invaluable. The 22-watt circuline fluorescent tubes softly brighten the work area from all sides, providing a shadow-free, light-balanced field of vision that magnifies the subject while preventing eye strain. Each Magnifier comes with a three-conductor cordset and a 22-watt fluorescent bulb. The KFM-1/A table clamp model and the KFM-2-FE weighted-base model come with the standard three-diopter lens ($\frac{3}{4}X$ magnification). The KFM-1/A (5) comes with a five-diopter lens ($1\frac{1}{4}X$ magnification). Additional lenses may be purchased to increase the magnifying power of these lamps.

KFM-1/A (3) Standard Model (Gray)

064X065 1-5, \$215.00 ea.; 6-up, \$193.50 ea.

KFM-1/A (5) Diopter Model (Gray)

064X068 1-5, \$229.00 ea.; 6-up, \$206.50 ea.

KFM-2-FE Weighted-Base Model (Gray)

064X076 1-5, \$299.00 ea.; 6-up, \$272.00 ea.

064X410 Type 31640 (T9) Replacement Bulb 16.00 ea.

Additional KFM Accessories

064X300 50201 Four-Diopter (1X Power) Lens \$47.00 ea.

064X302 50202 Eight-Diopter (2X Power) Lens 54.00 ea.

064X328 50206* 10-Diopter (2 $\frac{1}{2}X$ Power) Swing-Away Lens 110.00 ea.

* Is installed directly below the main lens and can be used with any lens for more than double the power.

FL-Series Fluorescent Table Lamps

Luxo's FL-Series fluorescent lamps have been specifically designed to illuminate large work surfaces with sufficient evenly distributed light, particularly when the work space frequently has little or no other source of ambient lighting. The FL-1/A clamp-on model sweeps a full 45 inches and projects light from two 15" fluorescent tubes supplied over 360° for optimal clarity. An inverted reflector ridge inside light shield assures even light distribution.

The standard FL-1/A lamp comes complete with an "A" type bracket that allows it to be clamped to any standard horizontal work surface. An optional "D" bracket can be purchased to allow easy adjusting for use on drawing boards or other non-horizontal surfaces. Model FL-2-FE is supplied with 30" heavy-duty arms and a weighted base that allows the lamp to be used where clamping would be impractical. Each model comes complete with a three-conductor cord and two 15" fluorescent bulbs. Gray in color.

FL-1/A Standard Fluorescent Lamp

064X040 1-5, \$174.00 ea.; 6-up, \$157.00 ea.

FL-2-FE Weighted-Base Fluorescent Lamp

064X060 1-5, \$254.00 ea.; 6-up, \$229.00 ea.

064X260 Optional "D" Type Bracket Only 18.00 ea.

064X400 Type 31641 (T8) Replacement Bulb 13.50 ea.

The Wave II Series

Wide-Angle Visual Enlargement Illuminated Magnifier

Wave II Lamps by Luxo Corporation represent the next generation of illuminated magnifiers. They've taken KFM technology and expanded it to create lamps with large $6\frac{3}{4}" \times 4\frac{1}{2}"$ lenses for more optimal viewing and inspection. Wave IIs utilize the same popular $\frac{1}{2}"$ metal K-arms that have become a Luxo trademark for quality and reliability. These are combined with the extra-wide viewing area to create a really special series of magnifiers.

Choose from two Wave II configurations. Model 17805 is a clamp-on lamp that mounts to any horizontal work surface, and the 17807 features a weighted base for stand-alone applications where clamping is not practical or desired. Each Wave II has two independently switched lamps located on either side of the lens that direct the light at slight angles to eliminate bounce-up glare. By being independently switched, they also allow angular lighting that is useful for some SMD applications. These natural color light tubes are state-of-the-art, 7-watt bulbs that minimize the amount of heat radiated and the amount of energy drawn.

Each Wave II magnifier comes complete with a three-diopter lens, a three-conductor cordset and two each 7-watt compact fluorescent bulbs. The non-reflective black color provides maximum contrast.

Model 17805 Clamp-on Wave II

064X785 1-5, \$352.00 ea.; 6-up, \$317.00 ea.

Model 17807 Weighted-Base Wave II

064X790 1-5, \$420.00 ea.; 6-up, \$389.00 ea.

064X420 Type 34436 Replacement Bulbs 20.00 ea.

064X810 50061 Optional Four-Diopter Snap-In Lens 50.00 ea.

064X812 50062 Optional Eight-Diopter Snap-In Lens 57.00 ea.



Stubby Fluorescent Lights

Bright Work Lights in a Compact Size

Designed to work in tight areas, these compact fluorescent work lights feature cool, energy-efficient 13-watt lights in shatter-proof housings. Full-length reflectors provide light output equivalent to 60-watt incandescent bulbs. These high-intensity lamps are safe to handle with no danger of burns. Molded multi-position hanger hooks rotate 360 degrees. Premium-quality construction features include shatter-resistant outer housings, three-conductor plug-in ballasts and protected push-button on/off switches on the handles. All electrical components are sealed for user safety, and the oil-resistant power cords are UL-listed.

The FL 158 is a 15-foot line cord model. The CR 70 is the 40-foot retractable-cord model with a heavy-duty power take-up reel. An optional magnetic clamp provides easy wall or ceiling mounting. These 12" x 2" lights meet OSHA standards and carry one-year warranties.

366X148 FL-158 Stubby Light1-11, \$30.00 ea.; 12-up, \$27.50 ea.
366X141 CR-70 Retractable Light.....1-11, 69.00 ea.; 12-up, 63.00 ea.
366X225 M-15 Mounting Clamp.....10.00 ea.

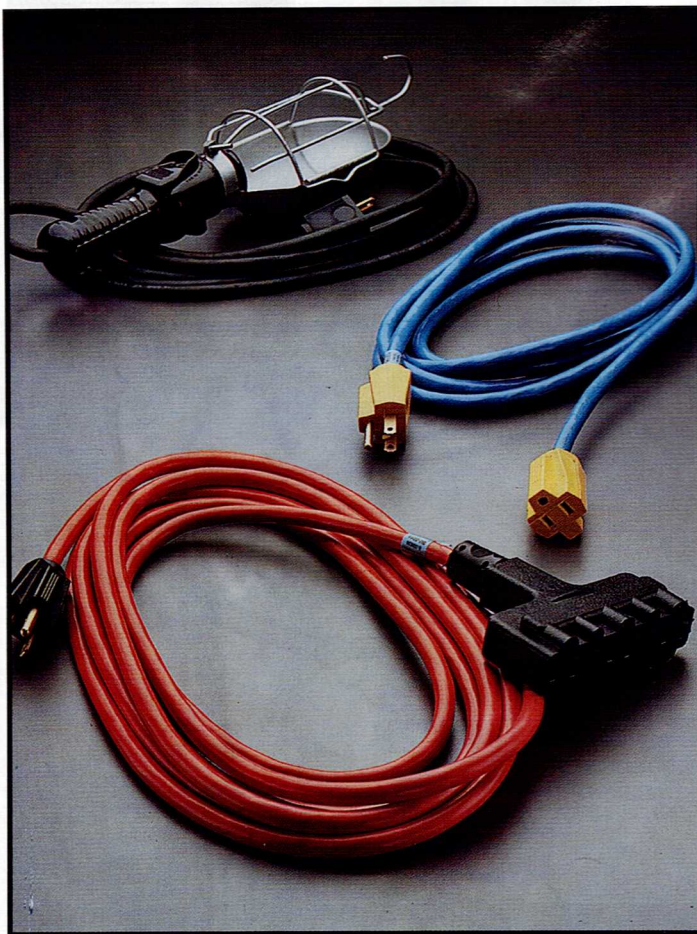
Standard Fluorescent Utility Lights

Heavy-Duty, Energy-Efficient Lamps

These rugged, heavy-duty fluorescent utility lights feature cool, energy-efficient 15-watt fluorescent lamps. Full-length reflectors provide light output equivalent to 60-watt incandescent bulbs. These standard-size, powerful utility lights are safe to handle with no danger of burns. Molded multi-position hanger hooks allow for easy manipulation of the light source. Premium-quality construction features include shatter-resistant outer housings, three-conductor plug-in ballasts and easy push-button on/off switches. All electrical components are sealed for user safety, and power cords are UL-listed.

The FL 258 comes with a 25-foot line cord. The retractable CR 60 has 40 feet of oil-resistant line cord with a heavy-duty power take-up reel. An optional magnetic clamp provides easy wall or ceiling mounting. These 20" x 2" lights meet OSHA standards and come with one-year warranties.

366X150 FL-258 Std. Light1-11, \$32.00 ea.; 12-up, \$29.00 ea.
366X140 CR-60 Retractable Light.....1-11, 69.00 ea.; 12-up, 63.00 ea.
366X225 M-15 Mounting Clamp.....10.00 ea.



mid-state
MANUFACTURING CORPORATION



Three-Wire Trouble Lights

With 16/3 SJ UL .365 O.D. Black Rubber Cords

Premium-quality trouble lights feature phenolic handles, push-through switches, single outlets, metal swing-open guards and three-wire plugs. Heavy-duty construction and UL-listed 16/3 SJ power cords provide reliable, long life. Choose from three cord lengths (15-50'). One-year warranty.

Stock No.	Part No.	Length	Amps	Watts	1-11	12-up
366X250	SJ-156	15'	13	1625	\$19.25	\$17.75
366X256	SJ-256	25'	13	1625	23.25	21.50
366X270	SJ-506	50'	13	1625	35.50	32.50

All-Weather Indoor-Outdoor Extension Cords

14/3 SJEW-A .390 O.D. Blue Three-Wire Grounded Cords

Three-wire indoor/outdoor extension cords feature heavy-duty construction with UL-listed 14/3 SJEW-A rated power cords and rugged single outlets. Premium-quality cords are designed for industrial usage and long life. Choose from five cord lengths (10-100'). One-year warranty.

Stock No.	Part No.	Length	Amps	Watts	1-11	12-up
366X396	SS3-104	10'	15	1875	\$ 9.00	\$ 8.25
366X404	SS3-154	15'	15	1875	11.50	10.50
366X408	SS3-254	25'	15	1875	17.00	15.75
366X417	SS3-504	50'	15	1875	30.00	27.50
366X428	SS3-1004	100'	13	1875	57.00	52.50

Triple-Connector Indoor-Outdoor Cords

14/3 SJT W-A .390 O.D. Orange Grounded Vinyl Cords

These premium-quality three-wire indoor/outdoor extension cords feature heavy-duty construction with UL-listed 14/3 SJT W-A rated power cords and rugged triple outlets. Designed for industrial usage and long life. Choose from four cord lengths (15-100'). One-year warranty.

Stock No.	Part No.	Length	Amps	Watts	1-11	12-up
366X480	TC-154	15'	15	1875	\$15.00	\$13.75
366X485	TC-254	25'	15	1875	20.50	18.75
366X490	TC-504	50'	15	1875	37.00	34.00
366X500	TC-1004	100'	15	1875	67.00	61.50



Trimline Series

Rugged, versatile multi-length strips provide a real convenience wherever multiple outlets are required. Trimline models are widely used in racks and on workbenches, production lines and lab tables. No wiring is required; just plug them in. Each model is UL rated and circuit breaker protected.

The 2' UL7208 units are 25" L x 2" W x 1" H and have built-in amber pilot lights. The 4' UL7415 strips are 49" L x 1.5" W x 1.4" H. The 6' UL7610 models measure 73" L x 1.5" W x 1.4" H. Each model comes with a 6' or 15' (14/3 SJT) power cord. One-year warranty.

Stock No.	Model No.	No. of Outlets	Master Switch	Cord Length	Prices	
					1-11	12-up
101X720	UL7208-6	8	Yes	6'	\$43.00	\$38.75
101X724	UL7208-15	8	Yes	15'	47.25	42.50
101X751	UL7415-6	15	Yes	6'	64.00	59.00
101X752	UL7415-15	15	Yes	15'	69.00	63.50
101X761	UL7610-6	10	Yes	6'	66.00	61.00
101X765	UL7610-15	10	Yes	15'	71.00	65.00

Premier Series

The designer Premier Series features a lower profile and more contoured shape than traditional power strips. Color-coordinated beige components are perfect for areas where esthetics are important. Applications include office environments, work stations, laboratories, retail stores, etc.

Each strip is UL listed, has circuit breaker protection and utilizes "U" grounded duplex outlets for maximum protection. Standard model ULA4E measures 9.25" L x 2.4" W x 1" H. Deluxe model ULA6TME is 12" L x 2.4" W x 1" H and features a master on/off switch and pilot light. Each model comes with a 6' or 15' (14/3 SJT) power cord. One-year warranty.

Stock No.	Model No.	No. of Outlets	Master Switch	Pilot Light	Cord Length	Prices	
						1-11	12-up
101X340	ULA4E-6	4	No	No	6'	\$16.00	\$14.50
101X342	ULA4E-15	4	No	No	15'	20.00	18.00
101X350	ULA6TME-6	6	Yes	Yes	6'	25.00	22.50
101X352	ULA6TME-15	6	Yes	Yes	15'	29.00	26.00

Standard Industrial Line

Designed to be the safest power strip available, these popular models have provided industries, offices, schools and labs with an unparalleled standard of excellence.

Each model is UL rated, CSA certified and circuit breaker protected.

Compact UL602CB model measures 8.75" L x 2.4" W x 1.5" H. Mid-length UL24CB model is 13.25" L x 2.4" W x 1.5" H and features master on/off switches and pilot lights. Both available with 6' or 15' (14/3 SJT) power cord. One-year warranty.

Stock No.	Model No.	No. of Outlets	Master Switch	Cord Length	Prices	
					1-11	12-up
101X602	UL602CB-6	5	No	6'	\$21.50	\$19.25
101X604	UL602CB-15	5	No	15'	26.00	23.50
101X380	UL24CB-6	6	Yes	6'	28.50	25.50
101X382	UL24CB-15	6	Yes	15'	33.00	29.75

Datagard® Model DG315-R

Surge Suppressor for Rack-Mount Equipment

Powerful surge and noise suppression in a unique rack-mounted unit are economically priced. With a track record of reliability and proven performance, Datagard® DG315-R is fully tested to comply with UL Standard 1449 (600 V) and meets ANSI/IEEE C62.41-1980 (IEEE587-1980). From SL Waber's Platinum Series designed for large office and industrial applications, it is especially recommended where noise is a critical factor.

This black model with a chrome front fits all 19" standard racks (18.25" x 1.25"). It features lighted master off/on switch, 15-A max push-to-reset circuit breaker and SJT 14/3 cord set. Specifications include: electrical rating (15 A, 125 V ac, 60 Hz, 1875 W, continuous duty); maximum surge current (8x20 microsecond surge pulse: 6500 A); maximum energy dissipation (120J: 3x70); modes of surge protection (H-N); clamping response time (<1 nsec); modes of noise rejection (transverse and common); noise attenuation (20 dB-40 dB) plus noise frequency range (150 kHz-100 MHz).

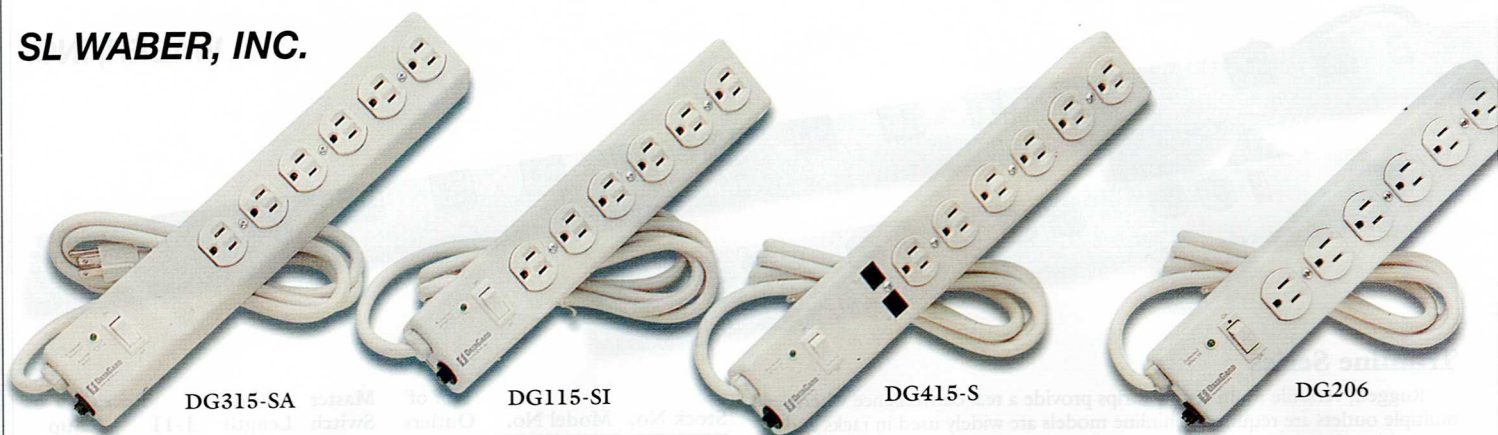
The front plate is 19" long while the back cover is 17" long. Both are 1.375" wide. The back cover is 2.375" tall. Lifetime warranty.



Stock No.	Model No.	No. of Outlets	Cord Length	Overall Length	Prices	
					1-11	12-up
101X155	DG315-R	6	6'	19"	\$110.00	\$99.00



SL WABER, INC.



Datagard® Surge and Noise Suppressors

Powerful Surge Protection at an Economical Price

- Fully compliant with UL Standard 1449
- Choose from four levels of protection

With a track record of reliability and proven performance, each Datagard® is fully tested to UL Standard 1449 (400 V) and meets ANS/IEEE C62.41-1980 (IEEE587-1980). Each beige unit features Type III mounting, master switch, circuit breaker and SJT 14/3 cord set. Common specifications include: electrical rating (15 A, 125 V ac, 60 Hz, 1875 W, continuous duty); maximum surge current (8x20 microsecond surge pulse: 6500 A); maximum energy dissipation (120J: 3x70); modes of surge protection (H-N, H-G, N-G); and clamping response time (<1 nsec).

Model DG315-SA in the Platinum Series, designed for large office and industrial applications, is especially recommended where noise is a critical factor. It features transverse and common modes of noise rejection plus audible surge indicator. The popular Datagard Gold Series DG115-SI is specifically designed to protect computers, P.O.S. terminals, sensitive instrumentation

and other electronic equipment containing sensitive microprocessors. It features transverse noise rejection and visual surge indicator.

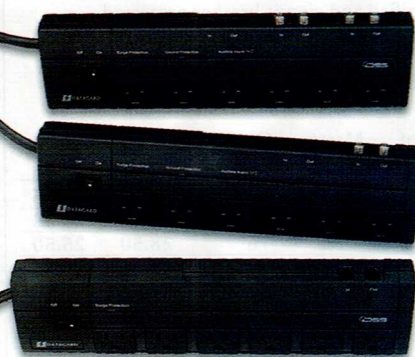
The DG415-S in the Gold Plus Series is designed to protect sensitive electronic communications equipment such as modems, FAX and answering machines, electronic telephone systems and computers. It features transverse noise rejection and visual surge indicator. Phone line protection includes two RJ-11 jacks, 4500 A; ring to ground and tip to ground; <1 nsec clamping response. Model DG206 in the Silver Series provides economical surge protection for general office equipment such as typewriters, word processors and calculators. Each model comes with a lifetime warranty.

Stock No.	Model No.	No. of Outlets	Cord Length	Overall Length	Prices	
					1-11	12-up
101X154	DG315-SA	6	6'	15.75"	\$69.50	\$63.00
101X150	DG115-SI	6	6'	14"	49.50	45.00
101X159	DG415-S	6	6'	15.75"	64.50	58.50
101X152	DG206	6	6'	12"	29.50	27.00

Digital Satellite System Series

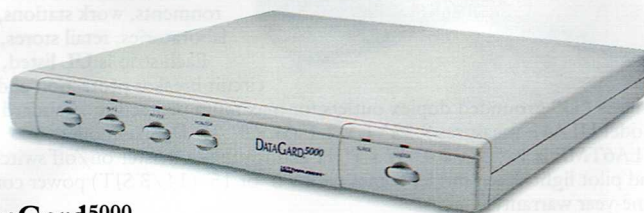
SL Waber's newest series of black plastic surge and noise suppressors is designed specifically to protect sensitive satellite equipment. Applications include home theater and small dish satellite systems, IRD systems, satellite two-way communication systems, CATV and future super-highway systems.

The DSS1 has one set of RJ-11 for voice/phone protection with visual indication. Model DSS2 has one set of RJ-11 and one set of coax protection. The DSS3 has one set of RJ-11 and two sets of coax protection. Models DSS2 and DSS3 have audible/visual indication plus ground LED. Maximum surge current up to 49,000 A. Safety certification: UL/CSA/IEEE. Lifetime warranty.



No. of Stock No.	Cord Model No.	Overall Outlets	Prices Length	Length	1-11	12-up
101X160	DSS1	6	6'	12 ⁷ / ₁₆ "	\$39.50	\$36.00
101X165	DSS2	6	6'	12 ⁷ / ₁₆ "	69.50	63.00
101X170	DSS3	6	6'	12 ⁷ / ₁₆ "	79.50	72.00

SL WABER, INC.



DataGard5000 DGPC Computer Power Center

Model DGPC Computer Power Center is designed for indoor surge protection in dry locations. Includes five grounded ac outlets plus phone/FAX/modem line protection. Features LED surge indicator, EMI/RFI noise rejection and five push-button controls with master on/off switch.

Specifications include operating line voltage (120 V ac), operating line current (15 A maximum), frequency (60 Hz), surge indication (surge LED), maximum surge current (13,000 A), noise rejection (150 kHz-20 MHz), UL 1449 rating (suppressed voltage 330 V), maximum surge voltage (6000 V), modes of noise rejection (transverse) plus phone line protection (tip to ground and ring to ground).

Includes 6-foot electrical cord. The 5-pound DGPC measures 3.125" x 16.25" x 15.75". Lifetime warranty.

DGPC Computer Power Center

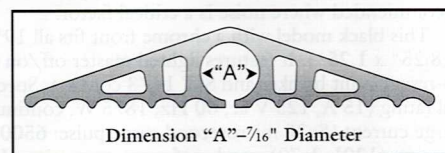
101X1151-9, \$89.50 ea.; 10-up, \$81.00 ea.

Cordgard® Electrical Cord Ducting

Cordgard® over-the-floor ducting is the quick, inexpensive and attractive way to cover hazardous and ugly electrical wires. It is ideal for offices, factories, retail stores and laboratories. Made of durable utility-grade vinyl. Ribbed slots on the bottom and double-faced tape prevent sliding on the floor.



The center hole is ⁷/₁₆" in diameter and accommodates electrical or telephone cords with diameters equivalent to 14/3 SJT or less. Each model is 6' long, 3" wide and ¹/₁₆" high with 3-pound shipping weight. Choose beige or brown.



101X190 G-6-BE Beige Cordgard1-9, \$16.95 ea.; 10-up, \$15.25 ea.
101X195 G-6-BR Brown Cordgard1-9, 16.95 ea.; 10-up, 15.25 ea.



NEW LOW PRICES!

Power Conditioners

Voltage Regulators with Surge and Noise Suppression

- Maintain efficient voltage regulation during brownouts
- Protect computer equipment from over- and under-voltage damage
- Backed by the ultimate connected-equipment warranty

SL Waber's line of automatic Power Conditioners corrects brownouts (low-level voltages) plus over and under voltages while supplying surge and noise protection. Each model maintains a reliable, steady operating voltage to avoid untimely equipment shutdowns, confusion of data and damage to circuitry. Since the voltage level delivered to your equipment by the utility company may vary from what is required for safe operation, it is up to you to protect your equipment. Power Conditioners help reduce down-time and maintenance costs while extending your equipment's life expectancy.

Choose from four models, compared in the chart below, to fit your specific system requirements. Each model filters out unwanted noise and also provides visual surge loss indication. SL Waber's patented three-stage surge suppression design provides protection against surges up to 72,025 amps. It includes metal oxide varistors, gas tube and silicon avalanche diode. These



units feature 1-pico-second response time, transverse and common mode noise attenuation plus the industry's best UL 1449 rating of 330 volts.

SL Waber provides the best two-year, unlimited-cash-value, connected-equipment warranty in the industry. Should your connected equipment be damaged by a surge or spike (even caused by lightning), it will be repaired or replaced for up to two years from date of purchase.

Stock No.	Model No.	Output Rating	No. of Outlets	Overcurrent Protection	Cord Type	Input Current	Output Current	Clamping Resp. Time	Wgt. in Lbs.	Size (L x W x H)	Prices	
											1-5	6-up
101X203	PC-300	300 V A	2	4-A fuse	18/3 SJT	3.5 A max	2.5 A max	1 ps	7	8" x 4" x 5.8"	\$110.00	\$96.00
101X206	PC-600	600 V A	4	7-A circuit breaker	16/3 SJT	7 A max	5 A max	1 ps	9	8" x 4.5" x 6.3"	125.00	109.00
101X212	PC-1200	1200 V A	4	12-A circuit breaker	14/3 SJT	12 A max	10 A max	1 ps	12	8.8" x 5.3" x 6.3"	197.00	172.00
101X224	PC-2400	2400 V A	6	20-A circuit breaker	12/3 SJT	20 A max	16.7 A max	1 ps	18.3	9" x 5.5" x 7"	350.00	305.00

UPS Capability Comparison

Specifications	PH250	UPS500
Input Voltage	120 V ac, Single-Phase	120 V ac, Single-Phase
Input Current	12 A	12 A
Input Frequency	60 Hz $\pm 5\%$	60 Hz $\pm 5\%$
Input Protection	15-A circuit breaker	15-A circuit breaker
UPS Output Ratings		
Output Voltage	120 V ac, Single-Phase	120 V ac $\pm 5\%$, Single-Phase
Max Output Power Capacity	250 V A, 170 W	500 V A, 340 W
Max Output Current	12 A	12 A
Output Frequency	60 Hz nominal	60 Hz nominal
Peak/RMS Voltage Regulation from no load to full load	$\pm 5\%$	$\pm 5\%$
Transfer to Battery Back-Up		
Max Detection and Transfer Time	4 ms	4 ms
Low Voltage Detection Level transfer back to ac level	95 V $\pm 2\%$ 105 V $\pm 2\%$	95 V $\pm 2\%$ 105 V $\pm 2\%$
High Voltage Detection Level transfer back to ac level	137 V $\pm 2\%$ 130 V $\pm 2\%$	137 V $\pm 2\%$ 130 V $\pm 2\%$

SL WABER, INC.

Back-Up Power Supplies

NEW LOW PRICES!

New Low-Profile Design

Back-Up Power Supplies provide reliable protection against blackouts, brownouts and high line conditions. They feature surge-protected outlets and noise filtration plus precision-crafted, computer-generated wave form and power line tracking. An auto self-test checks internal circuitry and external loads on power up. The lightweight, compact units feature top-entry design, lighted LEDs and audible alarms. They meet UL and CSA standards.

Choose from two models compared in the chart above. The 7-pound PH250 measures 9.75" x 5.25" x 7" and comes with one battery. The 12-pound UPS500 is 11.75" x 5.25" x 7" and includes two batteries. These 12-V, 4-AH lead-acid batteries have a life expectancy of three to six years. Recyclable, user-replaceable batteries recharge in less than two hours. Each model includes a surge protection \$25,000 lifetime connected-equipment warranty, a two-year UPS product warranty and a one-year battery warranty.

101X825	PH250	1-5, \$129.00 ea.; 6-up, \$112.00 ea.
101X830	PH500	1-5, 242.00 ea.; 6-up, 210.00 ea.



ISOBAR ULTRA Surge Suppressors

Premium Surge/Noise Protection for Electronic Equipment

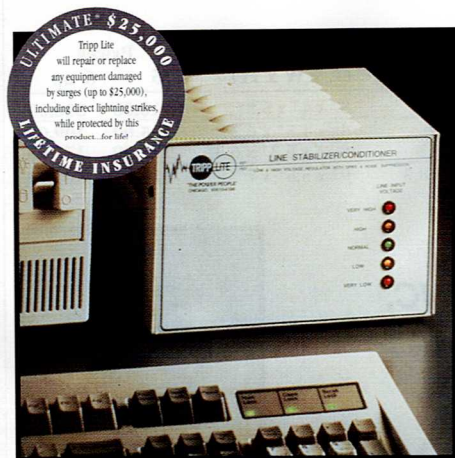
The most advanced surge suppressors on the market, ISOBAR Ultra Surge Suppressors safeguard your vulnerable electronic equipment. Offering outstanding protection from surges, spikes and line noise, Isobar Ultras feature unique, isolated filter banks that eliminate interference between connected equipment. That means different pieces of computerized equipment can plug into the same Isobar without causing system crashes, electronic interference or software glitches. Special "Cascade Circuitry" offers increased noise filtering from outlet to outlet, allowing you to choose greater protection for more sensitive equipment while instantaneous surge response provides suppression of up to 45,000 amp spikes. Advanced diagnostic LEDs protect equipment by alerting you to improper outlet wiring, loss of ac power and damage to protection circuitry. There are even ISOTEL models that are equipped with RJ11 jacks to provide full protection for FAX/modem lines. All ISOBAR Ultras feature Tripp Lite's Ultimate Lifetime Insurance providing \$25,000 coverage against surge damage for your Isobar and connected equipment.

Part Number	No. of Outlets	No. of Filters	Joules (Energy Absorption)	Cord Length
Isobar 4 Ultra	4	2	840	6'
Isobar 6 Ultra	6	3	960	6'
Isobar 8 Ultra	8	4	1080	12'

ISOTEL Ultra Surge Suppressors with RJ11 FAX/Modem Protection				
Isotel 4 Ultra	4	2	960	6'
Isotel 6 Ultra	6	3	960	6'
Isotel 8 Multimedia	8	4	1080	12'



		REGULAR PRICE	SPECIAL PRICE
295X255	Isobar 4 Ultra	\$ 89.00 ea.	\$ 66.50 ea.
295X265	Isobar 6 Ultra	104.00 ea.	76.00 ea.
295X270	Isobar 8 Ultra	119.00 ea.	86.50 ea.
295X295	Isotel 4 Ultra	109.00 ea.	81.50 ea.
295X297	Isotel 6 Ultra	119.00 ea.	89.50 ea.
295X299	Isotel 8 Multimedia	134.00 ea.	100.00 ea.



Line Stabilizers/Conditioners

Brownout and Surge Protection in a Single Unit

Brownouts can cause data loss, system reboots and unreliable results in some test equipment. Repeated exposure may overheat components plus cause hardware damage and system failure! Line conditioners protect connected equipment by maintaining constant power level during brownouts and high-voltage surges. Automatic voltage correction adjusts incoming voltages over widest range available (87-140 V) back to 120 V ac nominal output within ANSI C84.1 specifications. Built-in surge suppression and RFI/EMI noise filtering. LC-1800 and LC-2400 include LEDs for voltage status. All units carry up to \$25,000 Ultimate Lifetime Insurance for connected equipment. Two-year warranty.

Stock No.	Part No.	Output (Watts)	No. of Outlets	Surge Suppr.	REGULAR PRICE	SPECIAL PRICE
295X374	LS-604	600	4	360	\$159.00	\$133.00
295X350	LC-1200	1200	4	600	249.00	179.00
295X355	LC-1800	1800	6	720	339.00	244.00
295X357	LC-2400	2400	6	720	399.00	282.00

Rackmount Line Conditioners						
295X362	LCR-2400	2400	14	720	\$459.00	\$332.00

Isomiser Energy Saving Surge Suppressor

Pays for Itself in a Single Year Through Power Savings

Featuring proven Isobar technology, the Isomiser saves you money as it protects your computer system. When your computer is idle, the Isomiser cuts power to your monitor, conserving electricity and saving money on electric bills. Isomiser automatically monitors keyboard and mouse activity and returns monitor power when computer activity resumes. A user-settable timer provides a 5-60 minute monitor shutdown delay. Isomiser provides 27,000-amp protection against spikes, surges and features two isolated filter banks for extended noise reduction. \$10,000 Ultimate Lifetime Insurance covers your Isomiser and connected equipment against surge damage — including direct lightning strikes.



Specifications: four outlets (one timed), two filters, surge suppression (27,000 A), energy absorption (720 joules), cord length (6').

295X233	IM-4 Isomiser (Regular Price)	\$119.00 ea.
	SPECIAL PRICE	\$89.50 ea.

Mastertouch Command Console

Get Isobar surge and noise suppression in a convenient under-monitor design with Tripp Lite's Mastertouch Command Consoles. Six protected outlets provide power for your entire computer system from a single source. Control panels feature master and auxiliary switches that allow you to power up your entire system or each peripheral separately as well as static eliminator panels to prevent static damage. Both systems have diagnostic indicators that alert you to ac power problems before they can damage your system. The Mastertouch Plus features two RJ11 jacks to provide complete FAX/modem surge protection. Mastertouch consoles provide premium surge protection, handling surges up to 54,000 amps with 1080 joules of energy absorption. \$50,000 Ultimate Lifetime Insurance covers your command console and connected equipment against surge damage — including direct lightning strikes!



295X440	MT-6 Mastertouch (Regular Price)	\$134.00 ea.
	SPECIAL PRICE	\$103.00 ea.
295X442	MT-6 Plus Mastertouch PLUS (Regular Price)	\$149.00 ea.
	SPECIAL PRICE	\$118.00 ea.





PowerVerter DC to AC Power Inverters

Wave Form Compatible for Use with Sensitive Equipment

Designed for versatility and durability, Tripp Lite PowerVerter's transform 12 volt dc into clean, 120 volt ac power anywhere there is a dc source. With models ranging from 125 to 2400 watts of power, there is a PV inverter to handle any application. Ideal for your truck, work bench, camper or boat, these maintenance-free inverters provide clean ac power without the gas fumes or noise of electric generators. For power-hungry jobs, Tripp Lite's "peak power," frequency-controlled inverters provide up to 200% of their rated output for short durations to operate equipment with heavy start-up loads. The PV 750FC and 1200FC inverters can even run electric motors, high-torque power tools and TV/VCR combinations. And because of their modified wave form output, PV frequency controlled power inverters can be used to power mobile test equipment and other sensitive electronic gear. One-year warranty. Shipped surface freight only.



		Regular Price	SPECIAL PRICE
295X601	PV 125	\$ 91.50 ea.	\$ 79.50 ea.
295X604	PV 400FC	245.00 ea.	213.00 ea.
295X607	PV 750FC	360.00 ea.	313.00 ea.
295X612	PV 1200FC	590.00 ea.	513.00 ea.

Part Number	Capacity (Watts)	Peak Power (Watts)	Frequency Controlled	Applications
PV 125	125	175	No	Laptop computers, FAX machines, video games
PV 400FC	400	800	Yes	Household appliances, video games, television, stereo equipment
PV 750FC	750	1500	Yes	Small refrigerators, power tools, test equipment
PV 1200FC	1200	2400	Yes	Power tools, test equipment, microwaves, toaster-ovens, multiple loads

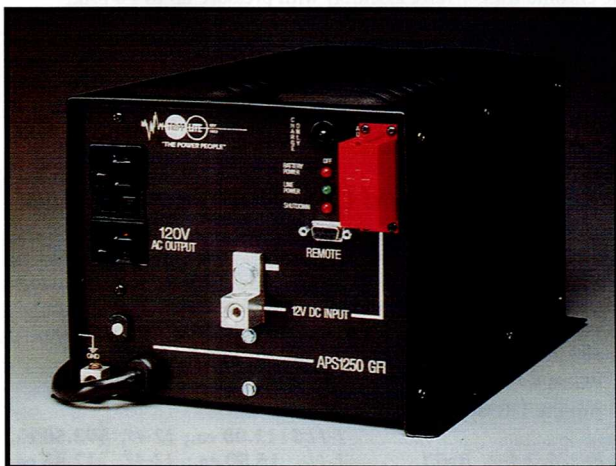


Precision Regulated DC Power Supplies

Use these high-quality, regulated dc power supplies to convert 120-V house current to 13.8 V dc ($\pm .5$ V) efficiently. The solid-state, integrated circuitry provides excellent regulation of output voltage for your delicate equipment maintaining up to 95% of no load values. Perfect for providing power for test equipment, ham radios, stereo equipment and amplifiers, Tripp Lite dc power supplies have large heat sinks and heavy-duty transformers for extended use. Units of 15 amps or larger feature "Crowbar" overvoltage protection to protect connected equipment from overvoltage damage. All units offer extensive filtering and overload protection, illuminated on/off switches and an attractive, small footprint design.

	Regular Price	SPECIAL PRICE
295X530 PR 3	\$ 37.50 ea.	\$ 32.50 ea.
295X532 PR 3UL	52.00 ea.	45.00 ea.
295X545 PR 4.5	44.00 ea.	38.00 ea.
295X547 PR 7	60.50 ea.	52.50 ea.
295X550 PR 10	89.00 ea.	77.00 ea.
295X552 PR 15	132.00 ea.	114.50 ea.
295X555 PR 25	184.00 ea.	160.00 ea.
295X557 PR 40	202.00 ea.	175.50 ea.
295X560 PR 60	295.00 ea.	256.50 ea.

Model	Features and Applications	Capacity
PR 3	CB radios, tape players	3 amps
PR 3UL	UL listed, CB radios, tape players	3 amps
PR 4.5	Single-sideband CBs, tape recorders	3 amps
PR 7	CB radios, low power VHF/UHF ham radios, dc stereo equipment	5 amps
PR 10	30-W transmitters, VHF/UHF ham radios, small amplifiers	10 amps
PR 15	50-W transmitters, small linear amplifiers, commercial/land mobile two-way radios, ham radios	12 amps
PR 25	75- to 100-W amplifiers, commercial two-way radios, test bench power supplies	20 amps
PR 40	150- to 200-W transmitters, medium linear amplifiers, test bench power supplies	32 amps
PR 60	250- to 300-W transmitters, multiple-piece radio installations; microwave applications	48 amps



APS Series Inverters

Automatic Power Switching DC to AC Inverters

Providing clean, reliable power from dc or ac sources, APS series PowerVerter's take inverter technology to a new level. APS units automatically sense and switch their output between outside ac power (from utility lines or generators) and dc battery power (when no ac power is available.) Use an APS inverter as a mobile power system or as a stationary UPS/emergency power supply! All APS series inverters provide "Peak Power" performance, are frequency controlled for use with sensitive electronic equipment and perform switchover to battery in 2 ms. A built-in regulated battery charger maintains connected batteries when outside ac power is available and run times are limited only by the number of batteries you connect. Two outlets. One-year warranty. Shipped surface freight only.



Stock Number	Part Number	Capacity (Continuous)	Peak Power	Size (H x W x D)	Regular Price	SPECIAL PRICE
295X030	APS 400	400	800	7" x 7" x 10"	\$308.00	\$268.00
295X032	APS 750	750	1500	7" x 7" x 10"	505.00	439.00
295X034	APS 1250	1250	2500	6.5" x 8.5" x 12"	803.00	698.00





The Right Products for the '90s

International and federal regulations now closely regulate the use of CFCs and chlorinated solvents in an effort to slow ozone depletion. These substances are being eliminated from many chemical formulations, and companies like Chemtronics have responded by developing innovative products that are based on new chemistries offering dramatically reduced environmental impact. You will find specialty chemicals that have little or no potential to damage the stratospheric ozone layer. These products are part of an all new line of reliable, hard-working precision cleaners and solvents formulated to meet the regulatory requirements of the 1990s.

Each Chemtronics product contains complete environmental impact data on the label to help you make decisions about which specialty chemical is right for your electronics or electrical application.

Freeze-It® 2000

Circuit Refrigerant Locates Thermal Intermittent Components

Ultra-pure E-Series Freeze-It 2000 consists of 1,1,1,2-tetrafluoroethane and is formulated to replace R12-/R22-containing products. Superior thermal properties quickly chill components by lowering temperature to -60° F/-51° C. This high-pressure circuit refrigerant is nonflammable, non-corrosive, residue-free and provides fast cooling action. Use it for locating thermal intermittent components, testing printed circuit boards for trace continuity from stress fractures and cooling entire pcbs. It may be used for heat-sink protection of components during soldering and desoldering operations. Choose from 10- and 15-ounce pinpoint aerosols for precision application.

348X853 ES1050 Freeze-It 2000 (10 oz.)1-23, \$11.00 ea.; 24-71, \$9.25 ea.

348X883 ES1550 Freeze-It 2000 (15 oz.)1-23, 15.90 ea.; 24-71, 13.25 ea.

Freeze-It® 2000 Antistat

Circuit Refrigerant Cools Static-Sensitive Components

Freeze-It 2000 Antistat has the cooling properties of Freeze-It 2000, but it also protects static-sensitive microcircuits from electrostatic charge and ice formation generated by refrigerant emission, high humidity and friction. It maintains the environmental integrity of components being tested. Freeze-It 2000 Antistat provides high heat transfer for faster cooling action on PC boards, surface-mount devices and other electronic assemblies. Contains 100% chloro-difluoromethane which vaporizes completely, leaving no residue. This nonflammable refrigerant contains no Class I substances. Meets Federal Specifications BB-F-1421. Fast cooling to -60° F/51° C. Choose from 10- and 15-ounce pinpoint aerosol cans.

348X854 ES1051 Freeze-It Antistat (10 oz.)1-23, \$11.30 ea.; 24-71, \$9.45 ea.

348X884 ES1551 Freeze-It Antistat (15 oz.)1-23, 16.00 ea.; 24-71, 13.40 ea.

CFC Free 70 PSI®

Economical General-Purpose Duster for Electronics

CFC Free 70 PSI is a compact, portable source of microscopically clean inert gas for precise dust and dry contamination removal. It quickly, safely and effectively removes dust, lint and metallic oxide particles from electronic equipment and precision instruments without scratching delicate surfaces. This ultra-pure compressed air duster can be used on microprocessors, data processing equipment, electronic devices, laboratory instruments, optics, microscopes, audio/video components, photo equipment, etc. A non-abrasive, non-corrosive formula, it is CFC-free, residue-free and safe for use on most surfaces. CFC Free comes in a 10-ounce aerosol can.

348X842 ES1015 CFC Free 70 (10 oz.)1-23, \$9.90 ea.; 24-71, \$8.25 ea.

Ultrajet® 2000

High-Pressure Duster Quickly Cleans Delicate Surfaces

Ultrajet 2000 consists of 1,1,2-tetrafluoroethane and is formulated to replace R12- and R22-containing products. This high-pressure ultra-pure duster/cleaner combines power, purity and performance. It is non-flammable, residue-free and won't scratch delicate surfaces. It delivers 70 psig. Ultrajet 2000 is engineered for all phases of electronic equipment maintenance and is particularly suited for applications involving printed circuit boards, surface mount devices, computers and other electronic assemblies. A powerful jet instantly removes dirt, dust, oxide particles and other airborne contaminants. Choose from 5- and 10-ounce aerosols.

348X829 ES520 Ultrajet 2000 (5 oz.)1-23, \$ 6.60 ea.; 24-71, \$5.50 ea.

348X844 ES1020 Ultrajet 2000 (10 oz.)1-23, 10.75 ea.; 24-71, 8.95 ea.

Ultrajet® 2000 System

Complete Dusting System with Chrome Trigger Valve Assembly

The completely reusable Ultrajet System is for high-volume users desiring maximum economy and purity in an ultra-pure product. Ultra-filtered to <0.2 microns, this compressed gas contains no Class I or 2 substances. The powerful jet instantly removes dry particulate and contaminants from delicate components, computers, electronic equipment, optics, laboratory instruments and negatives. Delivers up to 120 psig. System includes: reusable surgical-grade chrome trigger valve assembly with pressure up to 70 psig, stainless steel nozzle, final filtration disc, flexible 36" extension hose for hard-to-reach areas and 10-ounce refill can.

ES1020K Ultrajet 2000 System (10 oz.)

348X8461-23, \$29.90 ea.; 24-71, \$25.75 ea.

348X848 ES1020R 10-oz. Refill1-23, 10.60 ea.; 24-71, 8.85 ea.

Ultrajet® CO₂ System

The Safest and Most Powerful Ultra Pure Duster Available

This reusable ultra-pure, non-residue CO₂ duster system is safe for computers, optical surfaces and photographic materials. The Ultrajet CO₂ System effectively removes moisture and contaminants. Moisture-free CO₂ contains no CFCs. It is residue-free and won't harm delicate surfaces. The system includes: a recyclable high-grade carbon steel cylinder, reusable precision valve with 300 psi gas flow, a restricted-tip nozzle, pen-tip nozzle, 36" extension tube and 2.4-ounce CO₂ refill cylinder.

ES270 Complete Ultrajet System

348X8251-11, \$111.00 ea.; 12-47, \$92.50 ea.

348X828 ES275 2.4-oz. Refill1-11, 15.50 ea.; 12-47, 12.85 ea.

All Chemicals Shipped
Surface Freight Only





All Chemicals Shipped
Surface Freight Only



CFC Free Flux-Off® 2000

Best All-Around Flux Remover

This non-flammable, general-purpose defluxer is engineered for removing rosin flux and ionic soils. The non-corrosive blend is safe for most metal surfaces. Flux-Off 2000 is ideal for ultrasonic applications. It evaporates quickly and contains no CFCs. Not recommended for acrylics, ABS resins, polycarbonates and polystyrenes. Flux-Off comes in a 10-ounce aerosol can.

348X850 ES1035 Flux-Off 2000.....1-23, \$12.50 ea.; 24-71, \$10.35 ea.

Flux-Off® NR 2000

Removes All Types of Flux and Ionic Contamination

Use this specially blended non-CFC formula for spot cleaning and removal of all flux types. It penetrates and evaporates quickly to remove flux from electronic equipment and components without rinsing. This 16-ounce trigger spray blend provides excellent material compatibility.

348X896 ES1694T Flux-Off NR 20001-23, \$11.35 ea.; 24-71, \$9.45 ea.

Heavy-Duty Flux-Off® 2000

Removes Heavy and Encrusted Flux Deposits

This extra-strength solvent penetrates deeply to remove most non-ionic and ionic soils quickly. Engineered for pcb connectors, telecommunication devices and other precision electronic equipment. Ideal for R, RMA, RA and synthetic flux residue. Contains no CFCs and may be used in ultrasonic cleaners. Not recommended for acrylics, ABS resins, polycarbonates and polystyrenes. It comes in a 14.5-ounce aerosol can.

348X895 ES1692 Flux-Off 20001-23, \$14.55 ea.; 24-71, \$12.10 ea.

Gold Guard™ 2000

Cleans, Lubricates and Protects Metal Contacts

Gold Guard 2000 cleans, lubricates and protects in one application to extend connector life. This mild, nonflammable contact cleaner is formulated to clean delicate precious metals and connectors gently. It safely removes oxides, dust and other contaminants without abrasive damage to sensitive metals. Lubricant remains stable to 200° F and is compatible with many materials used in electronic equipment. Gold Guard comes in a 6-ounce aerosol can.

348X831 ES601 Gold Guard 2000.....1-23, \$8.25 ea.; 24-71, \$6.85 ea.

CFC Free Electro-Wash® 2000

Fast-Drying One-Step Cleaner and Degreaser

Electro-Wash is a general-purpose cleaning agent with strong cleaning and degreasing action. A precision wash, it contains no CFCs, evaporates instantly and leaves no residue. This ultra-pure solvent is filtered to <0.2 microns. It is engineered for fast cleaning and degreasing of electrical interfaces, contacts and connectors. High-pressure aerosol penetrates deep to remove encrusted dirt, grease, oxidation and contaminants. It comes in a 12.5-ounce aerosol can.

348X862 ES1210 Electro-Wash 2000.....1-23, \$14.30 ea.; 24-71, \$11.90 ea.

Pow-R-Wash™

Nonflammable Precision Cleaner for Metal and Plastic

Pow-R-Wash removes soil, flux, grease and oil from electrical and electronic components found in transportation, telecommunications, aeronautic and electrical transmission/distribution equipment. Use this highly effective precision cleaner on switches, circuit breakers, switching systems, potentiometers, electrical motors, gears, generators, brushes, commutators, PC boards and wire connectors. It evaporates quickly with no residue. Solvent flushes tight tolerance areas clean and may be used on energized equipment. Choose from 5- and 12-ounce size aerosol cans.

348X838 ES881 Pow-R-Wash (5 oz.).....1-23, \$12.40 ea.; 24-71, \$10.30 ea.

348X899 ES1681 Pow-R-Wash (12 oz.)...1-23, 24.60 ea.; 24-71, 20.50 ea.

Electronics Cleaner/Degreaser 2000

Fast-Drying Nonflammable Electronics Cleaner/Degreaser

Use this general-purpose cleaning and degreasing agent for electronic corrective and preventive maintenance. It penetrates to remove oil, grease, silicone, flux and adhesive. This CFC-free formula is non-corrosive and safe for metals. It is ideal for electronic assemblies, pcbs, motors, interfaces and sensitive components. This ultra-pure solvent is filtered to <0.2 microns. It is not recommended for use on acrylics, ABS resins, polycarbonates and polystyrenes. Choose from 14.5- and 18-ounce size aerosol cans.

348X892 ES1601 Cleaner (14.5 oz.).....1-23, \$14.10 ea.; 24-71, \$11.75 ea.

348X939 ES2201 Cleaner (18 oz.).....1-23, 17.25 ea.; 24-71, 14.40 ea.

Super Bio-Wash™

Nonflammable Aqueous Based Spray and Wipe Cleaner

Nonflammable, biodegradable cleaner safe for metal, plastic and glass not harmed by water. It can be used in hot or cold immersion, ultrasonic and spray applications. It removes flux, electronic and industrial soils, handling soils and dirt. It contains no ODCs, has low vapor pressure, superior solvency, is residue-free and rinses freely. It comes in a 16-ounce trigger spray.

348X897 ES1648T Bio-Wash.....Sorry, this item has been discontinued.



Contact Clean 2000

Best Cleaner for Metal-to-Metal Contacts

This heavy-duty cleaner is non-corrosive and safe for metals. It penetrates deeply to clean electrical and electronic contacts in electro-mechanical assemblies, pcbs, motors and interfaces. Restore and improve electrical continuity for all types of contacts and switches. Remove oil, grease, dirt, silicones, fluxes and adhesives. Quick-penetrating precision cleaner is non-flammable and evaporates quickly. It is not recommended for acrylics, ABS resins, polycarbonates and polystyrenes. Choose from 14.5- and 18-ounce aerosol sizes.

348X894 ES1602 Cleaner (14.5-oz.).....1-23, \$14.00 ea.; 24-71, \$11.50 ea.
348X940 ES2202 Cleaner (18-oz.).....1-23, 17.00 ea.; 24-71, 14.50 ea.

SD-7 Plast-N-Glas®

Static Free Non-Streaking Cleaner for Transparent Surfaces

Triple-function compound cleans, polishes and eliminates static charges. A single application dissipates potentially harmful electrostatic buildup while removing dirt, grease, ink, fingerprints and nicotine stains. For CRT display screens, scopes, dial faces, computer housings and medical devices. Will not streak, smear, scratch or abrade. Provides improved optical clarity and distortion-free reading. Long-lasting, noncorrosive foaming spray will not run or drip. Safe for most plastics and glass but not nylon mesh anti-glare screens. Comes in a 16-ounce aerosol can.

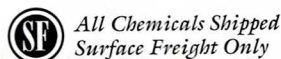
348X898 ES1668 SD-7 Plast-N-Glas.....1-23, \$6.75 ea.; 24-71, \$5.50 ea.

Kontakt Restorer® 2000

Cleans, Lubricates and Protects in One Step

Nonflammable deep penetrating aerosol spray protects metal contacts from carbon build-up, oxidation and corrosion. Use it on solenoids, switches, controls, circuit breakers, potentiometers, selector switches, plugs and sockets. Fast drying for quick rework and repair. Excellent dielectric properties. Minimizes friction and metal wear. Prolongs life of electrical contacts. For use on energized equipment. Comes in a 16-ounce aerosol can.

348X933 ES1628 Kontakt Restorer.....1-23, \$15.00 ea.; 24-71, \$12.50 ea.



All Chemicals Shipped
Surface Freight Only

Pow-R-Wash™ BrushClean™ System

Highly Effective Nonflammable Precision Cleaning System

This cleaning system safely cleans metals and most plastics. Use it on electrical and electronic components found in transportation, telecommunications, aeronautics plus electrical transmission and distribution equipment. Remove soil, flux, grease and oil from switches, circuit breakers, brushes, commutators, motors, generators, wire connectors and PC boards. Solvent flushes tight tolerance areas clean and evaporates quickly with no residue. May be used on energized equipment. Comes in a 5-ounce aerosol can.

348X839 ES881B Pow-R-Wash1-23, \$15.00 ea.; 24-71, \$12.50 ea.

CFC Free Electro-Wash® 2000 BrushClean™ System

Fast-Drying One-Step Cleaning and Degreasing System

Convenient-to-use system cleans soils, oxidation and contaminants. It is the best general-purpose spot-cleaning system for use on most plastics. Use it to clean PC boards, contacts, controls, meters, motors and other electronic assemblies. With low surface tension, solvent flushes areas under components clean. It cleans and degreases in one step with no rinsing required. Contains no ozone-depleting compounds. CFC and HCFC free. Not for use on energized equipment. Comes in a 5-ounce aerosol can.

348X833 ES810B Electro-Wash 2000.....1-23, \$8.50 ea.; 24-71, \$7.00 ea.

Flux-Off® II BrushClean™ System

Removes Water Soluble, No-Clean and All Other Fluxes

Quick, easy and efficient to use, this proprietary alcohol blend cleaner evaporates rapidly and leaves no residue. Flux-Off® II BrushClean™ System removes most types of organic and inorganic fluxes as well as non-ionic and ionic soils. It is excellent for removing water soluble and no-clean flux during rework and repair. Comes in a 6-ounce aerosol can.

348X836 ES830B Flux-Off II.....1-23, \$8.50 ea.; 24-71, \$7.00 ea.



FoamClean™

Label Adhesive Remover for Fast, Safe Cleaning

FoamClean™ Label Adhesive Remover is the easy way to remove the grime-collecting adhesive residue left behind by tape, stickers, labels, gum, wax, lipstick and crayons. This hard-working no-drip foam is engineered to be safe on plastics. Other brands attack plastic, but notice how FoamClean leaves sensitive plastic surfaces neat and clean. It even clings to vertical surfaces. That means no runs, no dripping and no puddles to clean up.

Restore and refurbish plastic-encased office equipment to like-new condition. Use FoamClean on plastic housings, keyboards, telephones and film canisters plus ceramic, metal and glass surfaces. It's as easy as peel, spray and wipe. First peel away as much tape, label or sticker as possible. Next spray foam onto adhesive residue and any remaining label material. Then wipe clean when foam collapses. Repeat if necessary for thorough removal. Pleasant, fresh scent. CFC and HCFC free. Comes in a 6-ounce aerosol can.

348X840 ES805 Label Adhesive Remover1-23, \$9.00 ea.; 24-71, \$7.50 ea.



CFC Free Flux-Off® 2000 BrushClean™ System

Quickly Removes R, RMA, RA and Synthetic Flux

Fast-drying solvent is engineered for spot cleaning fluxes and other contaminants found in repair and rework. It is ideal for use on printed circuit boards and SMD pads. This superior wetting solvent flushes areas under components clean. It is an effective spot cleaner for quickly and completely removing flux, oil, ionic and non-ionic soils. It is noncorrosive and safe for use on most surfaces. No rinsing is required. This flux remover provides excellent material compatibility. A CFC and HCFC free solvent, it has no ozone depleting compounds. Not for use on energized equipment. Comes in a 5-ounce aerosol can.

348X837 ES835B Flux-Off 2000.....1-23, \$7.25 ea.; 24-71, \$6.00 ea.





Premoistened Cleaning Pads and Swabs

Chempad™ — Lint-free, non-abrasive, general-purpose pads clean magnetic electronic components and non-optical surfaces. Saturated with 91% isopropyl alcohol/9% deionized water solution. Remove dirt, ink, grease, oxide build-up, oil and contaminants from tape heads, capstan rollers, guides and transport mechanisms. Compatible with plastic and rubber. Box of 50 pads.

348X187 CP400 Chempads1-23, **\$17.50 box;** 24-up, **\$14.50 box**

Chemswab™ — IPA-presaturated urethane foam swabs are non-abrasive. Precision clean computer components, audio/video equipment and electronics. Elongated foam head applicators provide easy access into hard-to-reach areas. Premoistened swabs evaporate quickly. Box of 25 swabs.

348X183 CS25 Chemswabs1-23, **\$22.00 box;** 24-up, **\$18.25 box**

Swabs and Applicators

A. Foamtips™ #100 — Cellular urethane foam swabs cover cotton buds for extra absorbency. These cleaning swabs entrap and remove particulate, dust and dirt from all sensitive surfaces. The 100% lint-free, non-abrasive swabs have 6" wooden handles. Package of 50.

348X420 CF50 Foamtips #1001-23, **\$13.00 pkg.;** 24-71, **\$10.75 pkg.**

B. Chamois Tips™ Double-Headed — These 6.5" applicators safely and efficiently clean and polish video/audio tape heads of VCRs, camcorders and other video equipment. They feature double chamois heads for added economy. Package of 50.

348X410 CCD50 Chamois Tips1-23, **\$49.50 pkg.;** 24-71, **\$41.00 pkg.**

C. Chamois Tips™ — Ultra-cleaned synthetic chamois on 3.5" applicators are ideal for cleaning and polishing tape heads of VCRs, camcorders and other video equipment. Package of 50.

348X400 CC50 Chamois Tips1-23, **\$27.00 pkg.;** 24-71, **\$22.50 pkg.**

D. Foamtips™ Pro — Cellular urethane cleaning swabs entrap and remove particulate, dust and dirt from all sensitive surfaces. These unique double-ended swabs offer two cleaning surfaces. The 6" polypropylene handles bend without breaking. Package of 50.

348X430 CFP50 Foamtips Pro1-23, **\$26.50 pkg.;** 24-71, **\$22.00 pkg.**

Precision Wipers

Twilwipes™ — Premium quality, highly absorbent 100% cotton wipers for critical cleaning and drying sensitive surfaces, components and equipment. Gentle burnishing action frees contaminants while unique twill weave entraps particulates. Pure, bias cut and lint-free. High liquid retention (9X weight). Remove grease, oil and oxide build-up from magnetic mechanisms. Excellent for relays, contacts, switches, connectors and gold fingers plus rosin flux removal. Packages of 300 6" x 6" and 150 9" x 9" wipers.

348X350 C600 6" x 6"1-23, **\$54.00 pkg.;** 24-71, **\$45.00 pkg.**

348X355 C900 9" x 9"1-23, **\$54.50 pkg.;** 24-71, **\$45.25 pkg.**

Opticwipes — Extremely soft, pliable, noncontaminating and non-abrasive wipers for optical surfaces, laboratory equipment and computer components. Clean, wipe and dry such optical-grade surfaces as lenses, film, negatives, slides and photographic equipment. Inspect, separate and dry wafers and semiconductor chips. High wet strength and superior absorbency (8X weight). Solvent resistant and static-free. Package of 9" x 9" wipers.

348X360 C920 9" x 9"1-23, **\$23.50 pkg.;** 24-71, **\$21.25 pkg.**

Screen Prep™ — Unique two-part wet/dry maintenance system for CRT/COM terminal and display screens, scope and dial faces, electronic panels, instrument glass and plastics. Premoistened pad cleans and controls static buildup; lint-free polyester pad dries and polishes. Box of 25 twin packs.

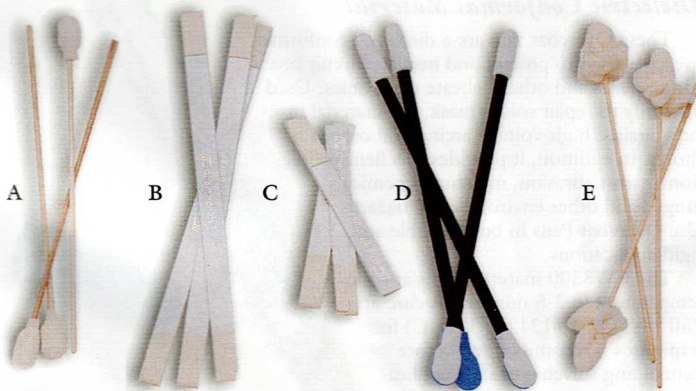
348X258 CSP20 Screen Prep Pads1-23, **\$18.75 box;** 24-71, **\$15.50 box**

Optic Prep™ — High-quality lens-grade tissue is presaturated with fast-drying, ultra-pure, non-abrasive solvent. Quickly remove dust, oil and contaminants as you clean and polish optical surfaces, lenses, photographic equipment, CRT screens and instruments. Residue free. Box of 50 pads.

348X186 CP410 Optic Preps1-23, **\$16.00 box;** 24-up, **\$13.25 box**

Static Clean Chemwipes™ — Fast drying semi aqueous wipes clean and leave long-lasting static-dissipative surface. Safe for cleaning all types of soils from most surfaces. Polyester/cellulose, nonwoven, lint-free wipers entrap dirt, soils and particles without recontaminating clean surfaces with loose fibers. Individual sheets in easy-to-use dispenser. Box of 48 9" x 9" wipers.

348X470 CW810 Chemwipes (48)1-11, **\$9.00 ea.;** 12-up, **\$7.45 ea.**



E. Foamtips #150 — Full-sized cellular foam swabs cover cotton buds for extra absorbency. These cleaning swabs entrap and remove particulate, dust and dirt from all sensitive surfaces. The 100% lint-free, non-abrasive swabs have 6" wooden handles. Package of 50.

348X425 CF5050 Foamtips #1501-23, **\$14.25 pkg.;** 24-71, **\$11.75 pkg.**



Circuit Works™ Conductive Pens

Draw Silver Polymer Links

Each CW2200 Conductive Pen draws in a highly conductive, air dry, silver polymer to link components, repair defective circuit traces and makes smooth jumpers in applications where heat curing is not possible. The conductor dries at room temperature in 5-10 minutes or can be heat cured for maximum performance. Safe for use with common circuit materials, use it over glass, solder mask and rigid or flex circuits. The air dry conductor is ideal for electronic prototype, manufacturing and repair applications where heat curing is not possible. It is solderable at low temperature and has limited resistance to aggressive solvents.

Heat cure 3-5 minutes at 250°-300° F (121°-148° C) for maximum conductivity and adhesion. Conductor is silver filled with a typical assay of 50-60% metal content. Highly conductive, it has typical electrical resistivity of 0.02-0.04 Ω /sq. @ 1 mil. Conductor has an operating temperature range of 500° F (260° C). Shelf life is 18 months unopened and can be extended by refrigeration.

Choose from Standard Tip Pen (STP) and Micro Tip Pen (MTP) models. The STP draws traces approximately 0.063" (1.6 mm). Use the MTP to apply traces as narrow as 0.031" (0.8 mm), slightly narrower than possible with the STP.

287X225 CW2200STP Std. Tip Pen1-23, \$11.95 ea.; 24-up, \$10.75 ea.

287X220 CW2200MTP Micro Tip Pen.....1-23, 11.95 ea.; 24-up, 10.75 ea.



circuit works

Circuit Works™ Conductive Epoxy Kit

Two-Part Quick-Cure Bonding

Use this two-part Conductive Epoxy for general-purpose conductive bonding in prototype and repair applications. Model CW2400's quick-cure material is ideal for bonding heat-sensitive components, solderless surface-mount connections, trace repair, static discharge and grounding. It bonds aggressively to a wide variety of materials. Excellent for making electronic connections to materials that cannot be soldered.

The silvered-colored material is mixed at a noncritical one-to-one ratio. (Do not cure below 75° F or 24° C.) Room temperature curing in eight hours. For fastest curing times, maximum conductivity and adhesion, heat the bond to between 150° and 250° F (65° and 121° C) for 10-15 minutes and allow to cool. Cured CW2400 material typically has resistivity as low as 0.001 Ω -cm. Working temperature range is -131° to 212° F (-90° to 100° C). Typical working pot life is 30 minutes.

287X240 CW2400 Epoxy Kit.....1-23, \$14.95 ea.; 24-up, \$13.50 ea.



Circuit Works™ Overcoat Pens

Dielectric Conformal Material

These Overcoat Pen are a dielectric conformal overcoat used to protect and insulate circuit boards, components and other delicate electronics. Used primarily to repair solder mask, the material insulates against high-voltage arcing and corona shorts. In addition, it provides excellent protection against abrasion, moisture, chemicals, fungus and other environmental hazards. Use Overcoat Pens in both flexible and rigid applications.

The CW3300 material cures at room temperature in 3-5 minutes. A cure at 250° to 300° F (121° to 148° C) for 5 minutes is recommended before demanding solvent-resistive applications. Air cures are recommended for flexible applications. Cured material has a typical resistivity of $>10^6 \Omega$ @ 50 V dc with dielectric strength of 500 v/mil dc. Cured flexibility is excellent. Choose from clear and green overcoat colors.

287X330 CW3300C Clear Overcoat1-23, \$9.95 ea.; 24-up, \$8.95 ea.

287X360 CW3300G Green Overcoat.....1-23, 9.95 ea.; 24-up, 8.95 ea.



Circuit Works™ Quick-Bond

Gel Adhesive Kit

Circuit Works™ Quick-Bond Gel is a nonmigrating cyanoacrylate gel with an accelerator. Use this kit to provide superior bond strength to a wide variety of materials including plastic, rubber and metal. It is ideal for filling gaps, wide tolerances or bonding dissimilar materials. This clear gel features excellent resistance to thermal cycling, impact, aging and weathering.

Quick-Bond Gel bonds in 30-60 seconds without accelerator. Quick-Bond Accelerator can be brushed on or applied directly over adhesive for reliable, instant bonding and excellent adhesion. Adhesive is fully cured in 5-10 seconds after contacting accelerator. Allow 24 hours for maximum properties. Service temperature is -65° to 200° F (-54° to 93° C) with a softening point of 329° F (165° C). Aluminum-to-aluminum tensile strength is 3770 psi.

287X400 CW4300 Quick-Bond Gel.....1-23, \$5.95 ea.; 24-up, \$5.50 ea.



Circuit Works™ Conductive Greases

Advanced Silicone Lubricants

Circuit Works™ Conductive Greases provide electrical and thermal conductivity, proven lubrication properties plus protection from moisture, corrosion and other environmental hazards. Choose from Silver and Carbon Conductive Greases. Both systems use advanced silicone lubricants that are compatible with metal, rubber and plastic. Applications include static discharge, thermal transfer and grounding in gears, electrical contacts, breakers, O-rings, splines, screw actuators, ball and roller bearings plus a wide variety of electro-mechanical assemblies.

The CW7100 Silver Conductive Grease contains pure silver for maximum thermal and electrical conductivity. This grey-colored material features a typical

resistivity of $<0.01 \Omega$ -cm. The CW7100 lubricant has excellent thermal conductivity of 50.0 (BTU/Hr/Sq.Ft./In./F°) while maintaining operating temperatures of -70° to 485° F (-57° to 252° C).

Model CW7200 Carbon Conductive Grease relies on cost-effective carbon graphite for good electrical conductivity. This black-colored material provides resistivity typically in the $<30.0 \Omega$ -cm range. The carbon grease features a high dropping point of over 650° F (343° C) with a typical operating temperature range of -70° to 485° F (-57° to 252° C).

287X501 CW7100 Silver Grease.....1-23, \$11.95 ea.; 24-up, \$10.75 ea.

287X533 CW7200 Carbon Grease1-23, 7.95 ea.; 24-up, 7.25 ea.





**READ
RIGHT**

Computer/Electronic Cleaning Supplies

InkAway™ Hand Cleaning Pads — Quickly and easily remove ink, toner and ribbon ink stains from hands and fingers. Safe, gentle formula contains lanolin to leave skin soft and prevent drying. Box of 72 pads in individual hermetically-sealed foil packets convenient for travel and storage.

TX1302 InkAway Cleaning Pads (72/box)
206X702.....1-9, \$16.00 ea.; 10-up, \$14.50 ea.

CD ROM Disk Cleaner — Designed to eliminate data error and signal interpretation skips caused by surface contamination, smudges and other foreign matter. Contains CD ROM Disk Holder/Storage Case, 1-ounce measured pump spray bottle of Disk Cleaner and nonabrasive cleaning pad.

TX258 CD ROM Disk Cleaner
206X258.....1-9, \$12.00 ea.; 10-up, \$11.00 ea.

Impact Printer Cleaning Kit — Ensure continuous operating efficiency of 132-column dot matrix, daisywheel, Selectric™ ball and thimble printers. Contains 5-ounce OfficeDuster II Jr., 4-ounce Print Element Cleaning Solution, 14.9" x 36" Print Element Cleaning Material (nonporous backing prevents cleaning solution from reaching printer interior, sensitive platens and rubber rollers), 4-ounce PlatenKleen, six InkAway Hand Cleaning Pads, six Office Equipment Cleaning Pads and 25 6" x 6" DataWipes.

TX2202 Impact Printer Cleaning Kit
206X862 ..*Sorry, this item is no longer available*



Microcomputer Complete Care Kits — Comprehensive preventative maintenance kits solve all microcomputer cleaning problems. Keep disk drives, screens, keyboards and printers operating at peak performance. Includes 3.5" or 5.25" Floppy Disk Head Cleaner with 1.75-ounce Metered Spray Head Cleaner (dropper bottle with 3.5"), 4-ounce Antistatic Screen Cleaner pump with 75 6" x 6" DataWipes, 1-ounce KeyboardKleen Solvent with 15 KeyboardKleen Swabs, 5-ounce Office Duster II Jr., 1-ounce Print Element Cleaning Solution with 9.5" x 36" Print Element Cleaning Material and 4-ounce StaticStopper pump.

TX263 Microcomputer Care Kit (3.5")
206X263.....1-9, \$49.00 ea.; 10-up, \$44.25 ea.

TX265 Microcomputer Care Kit (5.25")
206X265.....1-9, \$49.00 ea.; 10-up, \$44.25 ea.

Phone-Kleen™ Pads — Convenient, pre-moistened germicidal pads clean shared communication equipment like telephones, dictating equipment, earphones and microphones. Two antiseptic agents kill staph, most germs and bacteria on hard, non-porous surfaces. Box of 72 pads in individual hermetically-sealed packets.

TX1303 Phone-Kleen Pads (72/box)
206X703.....1-9, \$16.00 ea.; 10-up, \$14.50 ea.

TX2201 Laser Care Kit — Cleans laser printer transfer guides, paper guides, corona wires and other components. This is the fast, convenient way to reduce service calls, paper jamming and poor print quality. Includes 2.5-ounce OfficeDuster 3 Jr., 1-ounce Corona Wire Cleaning Solution, 4-ounce alcohol-free Guide Cleaner, 12 Office Equipment Cleaning Pads, 12 Head Cleaning Swabs and 15 6" x 6" DataWipes.

TX2201 Laser Care Kit
206X850.....1-9, \$35.00 ea.; 10-up, \$31.50 ea.



Laptop Valet™ Kit — Perfect for the productivity-conscious laptop computer user on the go. Handsome leather-like zippered carrying case holds 3.5" Floppy Disk Head Cleaner, 1-ounce nonaerosol dropper bottle of Head Cleaning Solution, six KeyKleen presaturated swabs, four Presaturated StaticStopper wipes and six One-Step Screen Cleaners.

TX275 Laptop Valet Kit
206X275
1-9, \$15.50 ea.; 10-up, \$14.00 ea.

NEW LOW PRICES!



Model FSK-SPC

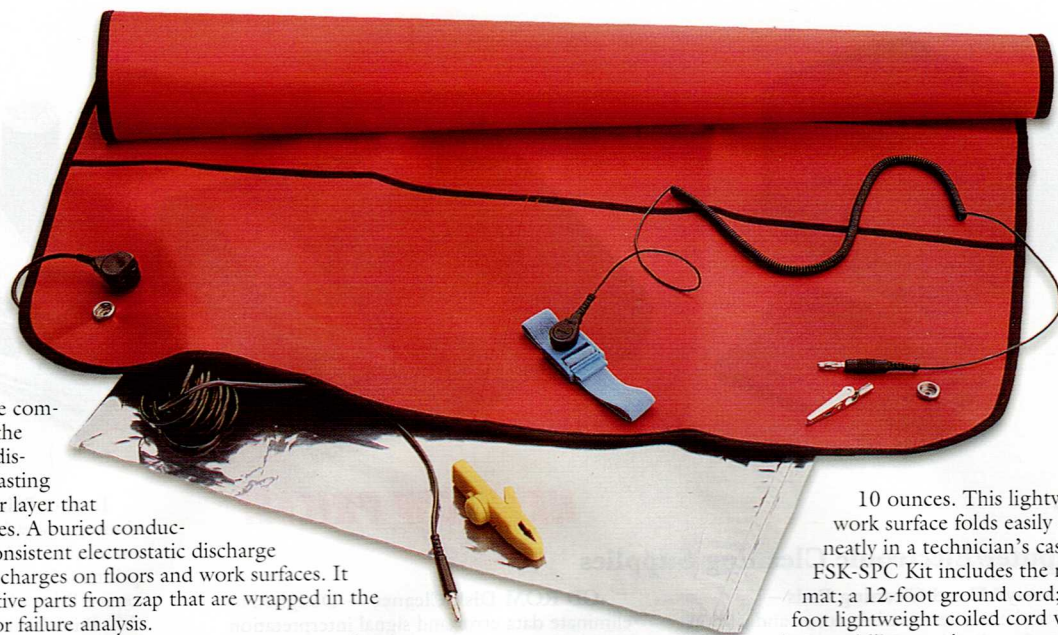
Anti-Static Field Service Kit

- Two-layer construction
- Packaged in a resealable ESD bag
- Lightweight mat folds easily

This top-quality Anti-Static Field Service Kit is an effective personnel grounding system. It is ideal for protecting static-sensitive components and circuit boards from the damaging effects of electrostatic discharge (ESD). The tough, long-lasting work mat features a resilient outer layer that prevents tears and resists punctures. A buried conductive inner layer guarantees that consistent electrostatic discharge will provide static shielding from charges on floors and work surfaces. It also will completely protect sensitive parts from zap that are wrapped in the mat for return to service center for failure analysis.

An accepted rate of static decay enables the FSK-SPC dissipative work surface to reduce the danger of ESD damage during repair functions in the field. Model FSK-SPC is made and tested in accordance with MIL HDBK 263, MIL STD 1686, EOS/ESD-SI-1987 and UK DEF. STD 59-98.

The durable field service mat has black bound edging for long life. It measures 24" x 24" with two handy 8" x 12" pockets and weighs less than



10 ounces. This lightweight work surface folds easily and fits neatly in a technician's case. The FSK-SPC Kit includes the red mat; a 12-foot ground cord; a 12-foot lightweight coiled cord with banana/alligator plug, post snap and

1-M Ω resistor; a bull clip with snap connector and adjustable blue cloth wrist band with post snap. This kit comes enclosed in an ESD shielding bag that can be resealed.

606X375 FSK-SPC Field Service Kit.....1-9, \$39.95 ea.; 10-99, \$36.00 ea.

Model 8505

Lightweight Field Service Kit

This 3M Lightweight Field Service Kit is designed to provide effective static protection for the electronics field technician in a very compact and easily transportable package. It provides the same level of static control as the full-sized 8501, but it fits in your pocket instead of your tool case. The static-dissipative work surface is a tough, durable red vinyl mat. It has a small 3.5" x 5" pocket along the bottom edge and a 10-mm female snap.

A unique feature is the flexibility provided by three lightweight, heavy-duty, 5-foot coiled ground cords. They allow the technician to choose the appropriate grounding configuration for each work site. Another technician can connect another wrist strap and a ground cord from a conductive circuit board container.

The 7-ounce mat measures 20" x 15" x .015" open and folds to only 6.5" x 3.5" x .75". Model 8505 mini kit includes a 2204 adjustable wrist band and an alligator clip. You also get a wrist strap ground cord, an extension ground cord that can double the length of any of the cords and a work surface ground cord with three built-in female banana jacks for plugging in additional ground cords.

600X802 8505 Field Service Kit.....1-9, \$60.00 ea.; 10-up, \$56.00 ea.



3M

Model 8501

Static-Dissipative Field Service Kit

Although static damage can occur anywhere microelectronic components are used, these sensitive devices are most susceptible during servicing. The 3M 8501 Static-Dissipative Field Service Kit prevents static damage that can occur when an unprotected service technician works on electronic equipment.

Model 8501 is designed to remove static charges on the technician quickly and reliably and to provide a static-free surface upon which to lay parts. The mat reduces the potential for sparking and shorting that exists with highly conductive models. It also minimizes charge drainage from battery packs. For added safety, cotton trim covers all edges. The construction of this work surface allows it to be folded and unfolded without cracking, even at temperatures well below 0° F. Red color keeps both the technician and the customer alert to the potential problem of static electricity.

This portable kit works on the principle of grounding. When technician attaches ground cord to wrist band and static dissipative mat, then connects cord to ground, existing static charges on technician or any conductive parts laid on mat drain away to ground. New charges are unable to accumulate.

Bright red static-dissipative work surface is 24" x 22" x .021" with dark

gray cotton edging. Two 8" x 11" pockets are sewn right into the work surface for easy transport of components. Includes 2204 adjustable wrist strap, 10' coiled cord that connects wrist strap to work surface attached to 5' ground cord and slide-on alligator clip (fits standard banana plug). Each ground cord section has its own independent 1-M Ω resistor.

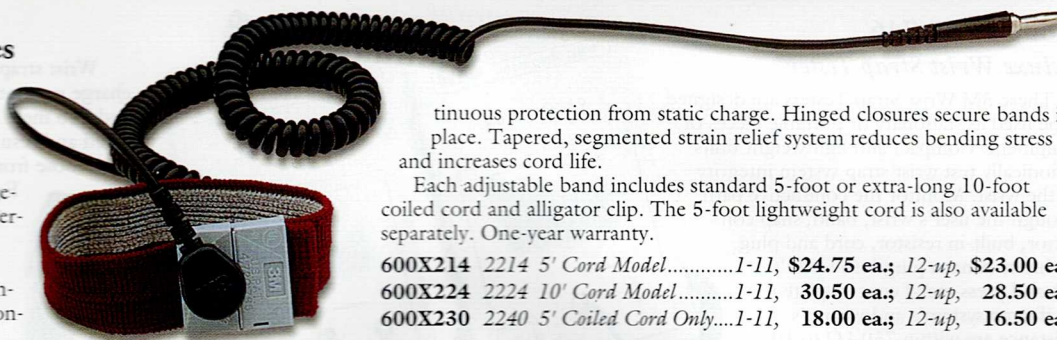
600X800 8501 Field Service Kit.....1-11, \$57.50 ea.; 12-up, \$54.00 ea.



Charge-Guard 2200 Series

Adjustable Wrist Straps

Wrist straps prevent pcbs and electronic devices from being degraded, damaged or destroyed but only when properly fitted. 3M's Charge-Guard 2200 Series combines reliable performance with unparalleled comfort. Soft, lightweight bands adjust to any wrist with a custom fit of 360° skin contact. Electrical conductivity provides con-



tinuous protection from static charge. Hinged closures secure bands in place. Tapered, segmented strain relief system reduces bending stress and increases cord life.

Each adjustable band includes standard 5-foot or extra-long 10-foot coiled cord and alligator clip. The 5-foot lightweight cord is also available separately. One-year warranty.

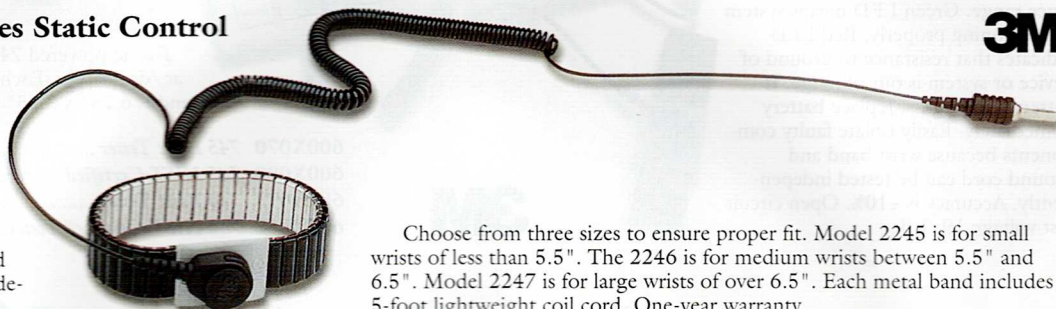
600X214	2214 5' Cord Model.....1-11,	\$24.75 ea.;	12-up,	\$23.00 ea.
600X224	2224 10' Cord Model.....1-11,	30.50 ea.;	12-up,	28.50 ea.
600X230	2240 5' Coiled Cord Only.....1-11,	18.00 ea.;	12-up,	16.50 ea.

Charge-Guard™ 2240 Series Static Control Metal Wrist Straps

Featuring Durability and Quality of Original "Twist-O-Flex"® by Speidel

The 2240 Series wrist straps feature quality expansion watchbands that have been converted into static control wrist bands. They were specially selected because of their reputation for years of dependable service as watchbands.

Static control metal wrist straps feature 3M's very durable and compact 5-foot ground cord, 3M's unique snap system which assures continuous electrical contact plus freedom of movement, 1-megohm resistor and insulative plastic caps on each link of the wrist band.



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Choose from three sizes to ensure proper fit. Model 2245 is for small wrists of less than 5.5". The 2246 is for medium wrists between 5.5" and 6.5". Model 2247 is for large wrists of over 6.5". Each metal band includes a 5-foot lightweight coil cord. One-year warranty.

600X235	2245 Small Metal Strap.....1-11,	\$34.00 ea.;	12-up,	\$30.50 ea.
600X236	2246 Medium Metal Strap ...1-11,	34.00 ea.;	12-up,	30.50 ea.
600X237	2247 Large Metal Strap.....1-11,	34.00 ea.;	12-up,	30.50 ea.

Ergoband® Adjustable Metal Wrist Bands

Expansion Links Provide Custom Fit

Metal wrist bands' patented linking system allows easy strap adjustment to fit any wrist size. Unique band comes in 130-mm length and is easily enlarged using one or more of the five included 10-mm nylon expansion links. Metal parts are made of jewelry-quality stainless steel. Super-durable bands are



coated with polyurethane-based polymer on oven-baked epoxy.

Extremely comfortable custom fit eliminates the need to stock bands of various sizes. Each wrist strap includes 6' or 12' coil wire. Extra cords optional. One-year warranty.

606X776	WS-AM6 6' Cord Model .....1-11,	\$14.00 ea.;	12-up,	\$12.90 ea.
606X779	WS-AM12 12' Cord Model ...1-11,	16.40 ea.;	12-up,	15.00 ea.
606X206	C-6 6' Coiled Cord Only.....1-11,	6.10 ea.;	12-up,	5.60 ea.
606X212	C-12 12' Coil Cord Only.....1-11,	7.25 ea.;	12-up,	6.70 ea.

Deluxe Adjustable Wrist Straps With Premium Quality Ground Cords

Fully adjustable, patented wrist bands are popular for their proven reliability. Crocheted cloth strap construction places five silver-plated conductive monofilaments on top of non-conductive inner surface, providing significantly improved skin contact. It is a comfortable way to prevent static build-up on personnel.

Each deluxe wrist strap includes 6' or 12' premium quality coil wire. Extra cords are optional. One-year warranty.

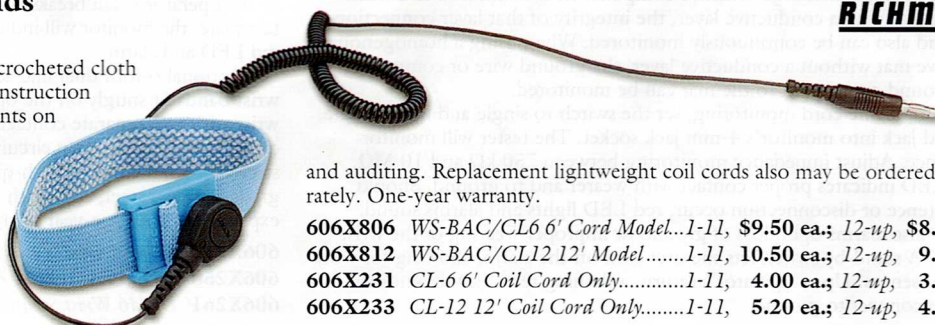


606X740	WS-AC6 6' Cord Model.....1-11,	\$13.00 ea.;	12-up,	\$11.90 ea.
606X742	WS-AC12 12' Cord Model.....1-11,	14.00 ea.;	12-up,	12.90 ea.
606X206	C-6 6' Coil Cord Only.....1-11,	6.10 ea.;	12-up,	5.60 ea.
606X212	C-12 12' Coil Cord Only.....1-11,	7.25 ea.;	12-up,	6.70 ea.

Standard Adjustable Wrist Bands With Coil-Lite Ground Cords

Use these fully adjustable wrist bands with crocheted cloth straps for reliable personal grounding. Band construction places five silver-plated conductive monofilaments on top of non-conductive inner surface, providing significantly improved skin contact. Popular, patented wrist bands are exceptionally comfortable and prevent static build-up.

Each standard wrist strap includes a feather-weight 6' or 12' coil-lite cord. Items are individually packaged and labeled. They are date and lot coded for total quality control



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and auditing. Replacement lightweight coil cords also may be ordered separately. One-year warranty.

606X806	WS-BAC/CL6 6' Cord Model...1-11,	\$9.50 ea.;	12-up,	\$8.50 ea.
606X812	WS-BAC/CL12 12' Model.....1-11,	10.50 ea.;	12-up,	9.50 ea.
606X231	CL-6 6' Coil Cord Only.....1-11,	4.00 ea.;	12-up,	3.50 ea.
606X233	CL-12 12' Coil Cord Only.....1-11,	5.20 ea.;	12-up,	4.55 ea.



Models 745/746

Deluxe Wrist Strap Tester

These 3M Wrist Strap Testers are designed to be used as stationary or portable pieces of equipment. Compact and lightweight units periodically test wrist strap system integrity on the wrist. Monitor the conductive path through the user's wrist, band, snap connector, built-in resistor, cord and plug.

Insert banana plug into tester's jack and press metal contact plate to see if strap system's and wearer's resistance are within 750-k Ω to 10-M Ω permanent, internally set resistance range. Green LED means system is functioning properly. Red LED indicates that resistance to ground of device or system is out of range. If battery LED lights, replace battery immediately. Easily isolate faulty components because wrist band and ground cord can be tested independently. Accuracy is $\pm 10\%$. Open circuit test voltage 19 ± 1 dc.



Wrist straps are the primary method to minimize charge generation on the human body. Models 745 and 746 meet MIL-STD-45662A. They need to be tested and results recorded on a regular basis.

Choose from battery- and ac-powered models.

Each is available in basic and NIST-certified versions. A certificate is provided assuring you that these models have been thoroughly tested and meet the exacting NIST standards.

The battery-powered 745 includes 3M Dual Lock™ Wall Mounting System, cover for wrist strap plug-in jack, 9-V alkaline battery and instruction book with test log.

The ac-powered 746 also includes a 9-V regulated 75-mA ac/dc adapter. Each unit weighs 7 ounces without battery and is 6.25" x 3.75" x 1.25". One-year warranty.

600X070	745 Basic Tester.....1-5,	\$234.00 ea.;	6-up, \$223.00 ea.
600X080	745 NIST-Certified Tester.....1-5,	365.00 ea.;	6-up, 347.00 ea.
600X073	746 Basic Tester.....1-5,	321.00 ea.;	6-up, 305.00 ea.
600X082	746 NIST-Certified Tester.....1-5,	452.00 ea.;	6-up, 430.00 ea.

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Models 720 and 722

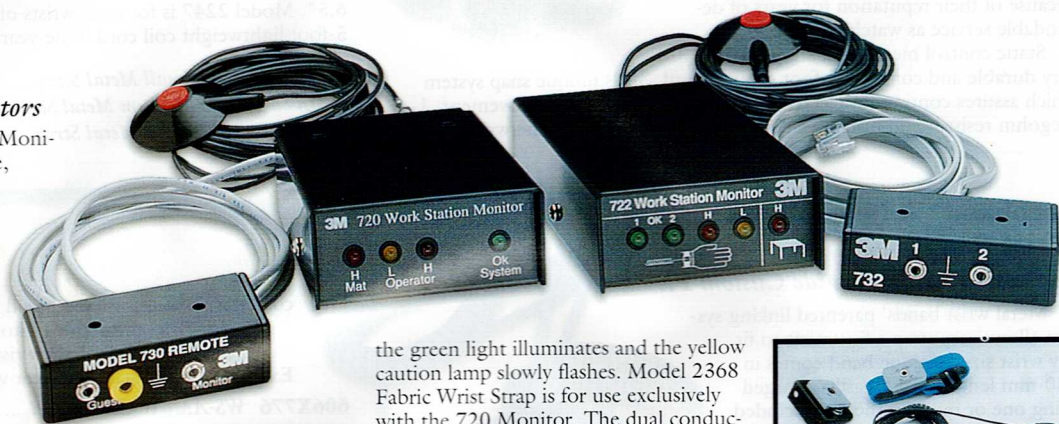
Continuous Workstation Monitors

The 3M 720 and 722 Workstation Monitors continuously monitor work surface, operator and wiring connection resistance. This reliable method actually includes the operator's skin resistance to determine if the system is operating properly. If the operator's resistance exceeds 10 M Ω or the wiring connections exceed 4 M Ω , audible and visible alarms are triggered. You are also warned of potentially dangerous low-resistance situations.

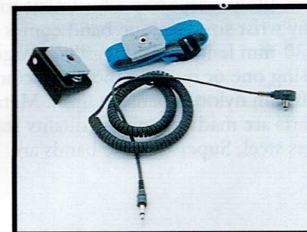
Each monitor uses a Model 2368 Fabric Adjustable Wrist Strap. This light, compact, dual-conductor wrist strap must be purchased separately. Dual conductors provide the resistance circuit that is monitored as well as grounding redundancy. If one conductor fails, the other will still function to prevent sensitive components from being exposed to static.

Model 720 includes prewired 730 Remote Input Jack plus mounting hardware. Use the 722 to monitor a workstation visitor as well as the primary operator. Alarm loudness is adjustable. Model 722 includes prewired 732 Remote Input Jack plus mounting hardware.

Choose from three options. The 3057 Stand-By Jack lets the operator disconnect the ground cord from the wrist band, plug it into the jack and leave the workstation without deactivating the monitor. When the jack is grounded,



the green light illuminates and the yellow caution lamp slowly flashes. Model 2368 Fabric Wrist Strap is for use exclusively with the 720 Monitor. The dual conductor band permit monitoring resistance to ground of operator. The 2360 Wriststrap Ground Cord is also available separately. Each monitor measures 6" x 3.25" x 1.5". Ninety-day warranty.



600X524	720 Workstation Monitor.....1-5,	\$119.00 ea.;	6-up, \$113.00 ea.
600X538	722 Workstation Monitor.....1-5,	183.00 ea.;	6-up, 174.00 ea.
600X345	3057 Stand-By Jack.....1-5,	9.00 ea.;	6-up, 8.50 ea.
600X240	2368 Fabric Adj. Wrist Strap..1-5,	14.50 ea.;	6-up, 13.50 ea.
600X245	2360 Wriststrap Grnd. Cord..1-5,	26.50 ea.;	6-up, 24.50 ea.

Model DS-CM

Dual Single Continuous Monitor

DS-CM is the only continuous monitor capable of monitoring loss of ground connection to single cord or dual line wrist-strapped person and/or work surface. This fail-safe warning system provides increased protection for handling of static discharge-sensitive components. If connected to a work surface containing a conductive layer, the integrity of that layer connection to ground also can be continuously monitored. When using a homogenous dissipative mat without a conductive layer, the ground wire or common point ground connection to the mat can be monitored.

For single line cord monitoring, set the switch to single and insert single wire cord jack into monitor's 4-mm jack socket. The tester will monitor capacitance. Adjust impedance monitoring between 750 k Ω and 10 M Ω . Green LED indicates proper contact with wearer and to ground. Should intermittence or disconnection occur, red LED lights and alarms sound. Monitor also alarms upon loss of ground or improper wearing of the wrist strap set. A stand-by switch lets the user turn off the alarm, allowing for work station absences. Upon operator's return, a flashing red LED reminds the user to reconnect to ground.

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Dual line cord monitoring provides a fail-safe redundant circuit system. Set the switch to dual and insert dual line cord jacks into monitor. Monitor resistance of dual line cord and band from 750 k Ω to 10 M Ω . If either wire becomes disconnected or the operator's skin breaks contact with a contact plate, the monitor will indicate fail with a red LED and alarm.

Optional 6-foot dual line adjustable wrist bands fit snugly on the operator's wrist with two separate contact points to close the otherwise open circuit. Choose stretch crochet cloth or high-quality jewelry-grade stainless steel, each with 10-mm nylon expansion links. One-year warranty.

606X240	DS-CM Continuous Monitor ..1-5,	\$130.00 ea.;	6-up, \$124.00 ea.
606X250	DLC6 Wrist Strap Adj. Cloth.....	21.50 ea.	
606X261	DLM6 Wrist Strap Adj. Metal.....	26.50 ea.	



8020 Series Work Station Grounding Kits

- Table mats
- Floor mats
- Choice of four colors

The 3M Static Control Work Station Grounding Kit provides the basic materials needed to set up a static safe work station. The unique material used to create the floor and table mat provides intrinsic conductivity as well as color. The conductivity of the work station is humidity independent and unaffected by age. Static charges on personnel, conductive bags, conductive tote boxes, etc. are drained to ground before static charge can cause damage to micro-electronic devices.



Each 3M Work Station Kit includes the following components:

Table Top Mat: 3M Static Control Mats are a unique tri-layer construction. The top layer is a durable semi-conductive vinyl that is available in four attractive colors. The semi-conductive top layer provides adequate discharging of conductors, but prevents shorting of pins on the backs of printed circuit boards when they are laid on the surface of the mat. Beneath the semi-conductive vinyl is a highly conductive scrim that provides an instant discharge path to ground. The foam backing of the mat is nonconductive and helps to prevent bypassing of protective resistors should the mat be laid on surfaces such as conductive floors or metal work benches. Includes wrist strap/table mat grounding system. Table Mat measures 2' x 4'.

Floor Mat: Drains static charge from personnel approaching the work bench in case they forget to attach wrist straps. Static charge is dissipated by merely stepping on the mat. Personnel should wear leather sole shoes for optimum protection. This mat is slightly cushioned for maximum operator comfort with the same unique tri-layer construction as the table mat. Floor mat measures 4' x 6'.

Wrist Strap: An elastic nylon band lined with stainless steel filaments is attached to a stainless steel back plate for a 360° conductive surface. To ensure proper fit, large, medium and small size wrist bands are provided. A coil type 5-foot ground cord is provided with banana plug and alligator clip termination. A 1-megohm resistor is molded into the plastic cap of the ground cord, and the exterior of the band is insulative for safety.

Ground Cords: A 15' ground cord connects the floor mat to the ground, and a 5' ground cord connects the table mat to the floor mat. Ground cords include a 1-MΩ resistor and the proper set up connectors.

Each Work Station Ground Kit includes one floor mat, one table mat, two ground cords (15' and 5') and one wrist band with its own ground strap. Available in four colors: gold, beige, gray and blue. Table top mats and floor mats may be purchased separately.

8020 Complete Grounding Kit

600X620 Gold1-2, \$272.00 ea.; 3-up, \$255.00 ea.

8022 Complete Grounding Kit

600X622 Beige1-2, \$272.00 ea.; 3-up, \$255.00 ea.

8023 Complete Grounding Kit

600X623 Gray1-2, \$272.00 ea.; 3-up, \$255.00 ea.

8024 Complete Grounding Kit

600X624 Blue1-2, \$272.00 ea.; 3-up, \$255.00 ea.

Floor Mats and Table Mats Only

600X640 8200 Floor Mat (Gold)1-5, \$201.00 ea.; 6-up, \$185.00 ea.

600X642 8202 Floor Mat (Beige)1-5, 201.00 ea.; 6-up, 185.00 ea.

600X643 8203 Floor Mat (Gray)1-5, 201.00 ea., 6-up, 185.00 ea.

600X644 8204 Floor Mat (Blue)1-5, 201.00 ea.; 6-up, 185.00 ea.

600X660 8210 Table Mat (Gold)1-5, \$87.00 ea.; 6-up, \$81.00 ea.

600X662 8212 Table Mat (Beige)1-5, 87.00 ea.; 6-up, 81.00 ea.

600X663 8213 Table Mat (Gray)1-5, 87.00 ea.; 6-up, 81.00 ea.

600X664 8214 Table Mat (Blue)1-5, 87.00 ea.; 6-up, 81.00 ea.

600X310 3040 Repl. Ground Cord Only (15')\$17.50 ea.

Velostat™ High Density Foam

Velostat 2800 Crosslinked Polyethylene Electrically Conductive Foam provides physical and electrostatic protection for sensitive microelectronic parts. Conductive qualities are compounded directly into the material using a carbon impregnation process for volume resistivity of less than 1×10 ohms-cm. Velostat 2800 foam has the extremely low resistivity required to be reliably grounded, is non-corrosive and has reduced sloughing characteristics.

This high density foam is primarily used for the safe storage and transporting of MOS-type integrated circuits and other static-sensitive devices. It is supplied in sheets that measure 24" x 36". Choose from three different thicknesses in black.

600X280 2806 - 1/8 (1/8" thick)1-9, \$19.50 ea.; 10-up, \$18.00 ea.

600X282 2806 - 1/4 (1/4" thick)1-9, 34.00 ea.; 10-up, 31.25 ea.

600X284 2806 - 3/8 (3/8" thick)1-9, 48.00 ea.; 10-up, 44.50 ea.

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Charge-Guard™ Rigid Work Surfaces

Static-dissipative Charge-Guard Rigid Work Surfaces from 3M have the high abrasion resistance of a hard laminate, yet they are as easy to install as table mats. They feature rounded edges and corners with non-glare surfaces which resist staining, scorching and common solvents. Work surface is ready to use with two factory-installed grounding cord snap fasteners and 3M's patented wrist strap/table mat grounding system. Choose from two sizes: (24" x 36" and 24" x 48") in two colors (beige and gray).

24" x 36" Rigid Work Surfaces

600X733 8343 Beige1-5, \$152.00 ea.; 6-up, \$139.50 ea.
600X734 8344 Gray.....1-5, 152.00 ea.; 6-up, 139.50 ea.

24" x 48" Rigid Work Surfaces

600X743 8353 Beige1-5, \$179.00 ea.; 6-up, \$164.00 ea.
600X744 8354 Gray.....1-5, 179.00 ea.; 6-up, 164.00 ea.
600X330 3048 Replacement Grounding Cord System\$20.00 ea.

Static Control Table Mats and Runners

The static charge on a person or object contacting one of these 3M mats or runners is drained safely away to ground because of the conductivity of the material. An included snap is connected to the mat or runner; the other end is attached to ground. The supplied ground cord or grounding device incorporates a 1-megohm current-limiting resistor and is terminated by a snap at one end and a ring-tongue terminal at the other.

Table mats are pre-cut to 2' x 4' or 3' x 4' and have two factory-installed snaps. The supplied 3048 Grounding System connects the mat to ground like a standard ground cord. Use the two provided banana jacks to connect one or two wrist straps to the same ground.

The runner is simply a continuous roll of table mat material measuring 2.5' x 24'. If you cut it into smaller mats to fit your requirements, be sure to install one ground/snap cord for every 10-20 feet of material.

8610 Static Dissipative 2' x 4' Table Mat

600X7551-5, \$39.00 ea.; 6-up, \$36.00 ea.

8612 Static Dissipative 3' x 4' Table Mat

600X7621-5, \$56.00 ea.; 6-up, \$51.00 ea.

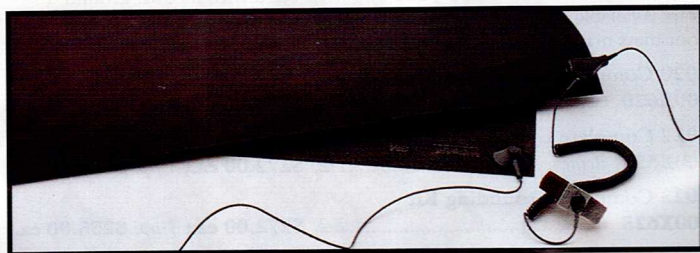
8614 Static Dissipative 2.5' x 24' Runner

600X7741-5, \$302.00 ea.; 6-up, \$278.00 ea.

8011 Velostat™ Grounding Kit

3M's Velostat Grounding Kit is a cost effective grounding kit with all of the same components as the 8020 series work station grounding kits. The difference is that the table and floor mats are made of black Velostat™ which is a volume conductive plastic that removes static charges from conductive items placed on them. Primarily for use in industrial settings, the grounding kit includes a floor mat, table mat, two ground cords (5' and 15') and wrist band with its own ground strap.

600X611 8011 Grounding Kit.....1-2, \$219.00 ea.; 3-up, \$205.00 ea.



Foot Grounders

These top-quality foot grounders accommodate all types of footwear to provide effective ESD protection, durability and comfort. Use them to establish a continuous ground path between mobile personnel and conductive flooring. Foot grounders incorporate easy-to-adjust ankle straps and knitted ribbon contact tabs. Heel grounders feature a unique, elasticized rear section that provides excellent fit and comfort for all shoe types and sizes. Use the HGD-1B with shoes. The HGD-1B with 30-inch tab is designed for boots. Specially reinforced black conductive rubber on the outside provides dependable static control and non-marking shoe contact surface. Each grounder comes with a 1-MΩ safety resistor.

606X598 HGD-1D Heel Grounder1-23, \$5.25 ea.; 24-up, \$5.00 ea.
606X400 HGD-1B Heel Grounder with 30" Tab1-23, 5.25 ea.; 24-up, 5.00 ea.
606X380 TG1 Toe Grounder.....1-23, 5.50 ea.; 24-up, 5.25 ea.

Grounding Hardware

Model 3033 Male Snap Fastener is designed for Velostat mats with 3.2-mm (.125") hole. The 3034 Female Snap Fastener is intended for Velostat mats with 3.2-mm (.125") hole. Use the 3050



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Chemtronics®

SD-22 Mat & Benchtop Cleaner

This formula cleans and reconditions ESD mats and benchtops while adding static-dissipative protection. SD-22 also may be used on such nonporous surfaces as storage cabinets, tool cribs and production/assembly surfaces. This spray cleaner is nonflammable, nonabrasive and non-corrosive plus chloride and amine free. It will not dry out ESD mats and is safe for



use on surfaces not harmed by water. SD-22 comes in a 16-fluid-ounce sprayer.

ES1664T SD-22 Cleaner

348X9371-23, \$10.00 ea.; 24-71, \$8.35 ea.

Female Snap Fastener with 8200 Series table and floor mats and runners. Model 3039 Wrist Strap Swivel Connector is designed for use with 8200 Series table mats. All come 10 to a package.

600X333 3033 Male Snap Fastener1-24, \$4.50 ea.; 25-up, \$4.25 ea.
600X334 3034 Female Snap Fastener.....1-24, 4.50 ea.; 25-up, 4.25 ea.
600X350 3050 Female Snap Fastener.....1-24, 8.00 ea.; 25-up, 7.75 ea.
600X339 3039 Swivel Connector.....1-24, 16.00 ea.; 25-up, 15.25 ea.



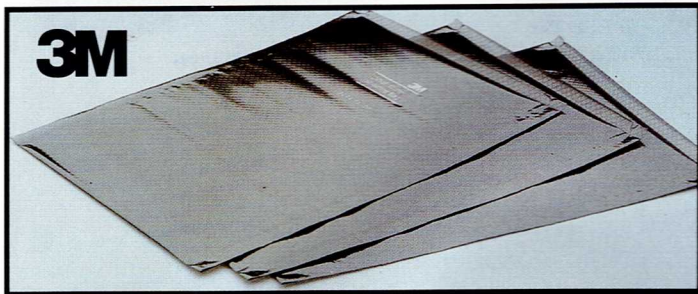
1900/1910 Metal-In Static-Shielding Bags

Flexible Protective Packaging

Protect your sophisticated integrated micro-circuits from electrostatic charge with 3M Metal-In Static-Shielding Bags. These economical pouches are the choice for less demanding applications where high durability, testing and reuse are not prime considerations. Use the 1900/1910 bags to encase static-sensitive electronic devices and components with electrostatic-shielding protection for worry-free shipment.

Packaging construction causes a charge on the bag to redistribute itself in nanoseconds, preventing any significant internal electric pulse and device damage. No solvents or adhesives that might craze or deteriorate components are used in the manufacturing process. This protective packaging method reduces not only hard and soft failures of equipment, but it also minimizes service calls and lost revenue.

Flexible bags provide three layers of comprehensive protection for sensitive components. A metal-in aluminum vapor coating is on a thinner 0.48-mil polyester than other static-shielding bags. The shielding layer is bonded between a topically coated static-dissipative polyester layer and a topically coated static-dissipative 2.5-mil polyethylene layer. Coatings are amine-free and non-corrosive.



1900 Metal-In Static-Shielding Bags

600X453	1900-1014 (10" x 14")	1-5,	\$26.50 ea.;	6-up,	\$24.50 ea.
600X462	1900-1216 (12" x 16")	1-5,	35.00 ea.;	6-up,	32.50 ea.
600X470	1900-1818 (18" x 18")	1-5,	54.50 ea.;	6-up,	50.50 ea.
600X400	1900-35 (3" x 5")	1-5,	7.25 ea.;	6-up,	6.75 ea.
600X412	1900-44 (4" x 4")	1-5,	7.25 ea.;	6-up,	6.75 ea.
600X423	1900-46 (4" x 6")	1-5,	8.25 ea.;	6-up,	7.75 ea.
600X438	1900-68 (6" x 8")	1-5,	12.50 ea.;	6-up,	11.50 ea.
600X441	1900-810 (8" x 10")	1-5,	18.75 ea.;	6-up,	17.25 ea.

Dimensions are inside measurements (W x L). Prices are per box of 100.

RCAS® 4150 Static Shield Bags

Unmatched Price/Performance!

- 48-gauge polyester layer
- Indefinite shelf life

RCAS® 4150 Static Shield Bags supply three layers of protection. The 48-gauge polyester layer is a cost-effective alternative. Critical metal layer is sandwiched between static-dissipative layers to protect the static shield. Surface resistivity of the metal layer is less than 10^2 ohms per square to shield against static charges. Static-dissipative polyethylene inner layer is amine-free, polycarbonate compatible and octanoic acid-free.

These bags are thoroughly tested under controlled laboratory conditions to meet or exceed the electrostatic protection requirements of EIA #541 Standard, MIL-B-81705C, MIL-STD-1686B and MIL-HDBK-263. All bags are hot stamped with product number, name and lot number. Choose from five standard bag sizes.

606X502	SSC-0406 4" x 6" (1000)	1-9,	\$ 61.50 ea.;	10-up,	\$ 55.00 ea.
606X506	SSC-0608 6" x 8" (1000)	1-9,	99.00 ea.;	10-up,	89.00 ea.
606X518	SSC-0812 8" x 12" (500)	1-9,	86.50 ea.;	10-up,	78.00 ea.
606X524	SSC-1014 10" x 14" (500)	1-9,	119.00 ea.;	10-up,	107.00 ea.
606X533	SSC-1218 12" x 18" (250)	1-9,	90.00 ea.;	10-up,	81.00 ea.

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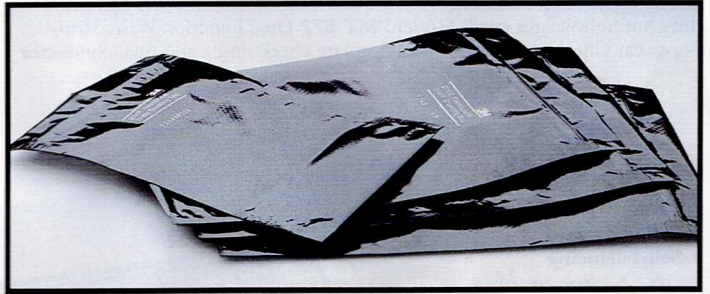
RCAS 4150 Specifications

Charge Dissipation: Fed. Test Method STD No. 101C, Method 4046 (5000 V to <50 V, 68° F, 15% RH-0.03 seconds)
Triboelectric Charge Generation: EIA-541 Appendix G (>2 nanocoulombs/square inch)
Surface Resistivity ASTM D 257: Outer layer (< 1.0×10^{12} Ω /sq.), metal layer (< 1.0×10^2 Ω /sq.), inner layer (< 1.0×10^{12} Ω /sq.)
Capacitive Probe EIA 541: Resistance at a discharge voltage of 1000 V, peak voltage >30 V
Thickness: 3 mil \pm 10%
Puncture: 10 pounds force
Transparency: 35-45% light transmission
Heat Sealable: Seal strength >10 pounds/inch

1900/1910 Specifications

Property	Test Method	Typical Value
Thickness	ASTM D2103	3.1 mil
Strength		
Tensile	ASTM D882	18 lbs./in. width
Puncture	FTMS 101	>12 lbs.
Seal	3M Test Method	Pass
Light Transmission	ANSI PH2.19	40%
Surface Resistance/Resistivity		
Interior	ESD S-11.11	< 10^{11} ohms
Exterior	ESD S-11.11	< 10^{11} ohms
Metalized Layer	Monroe #267	< 10^2 ohm/sq.
Shielding	EIA-541 (V-Zap)	<30 V
Electrostatic Decay		
Interior	EIA-541	<2 sec.
Corrosiveness	FTMS 101	Pass
Outgassing		
TML	ASTM E595	<1.0%
CVCM	ASTM E595	<0.1%

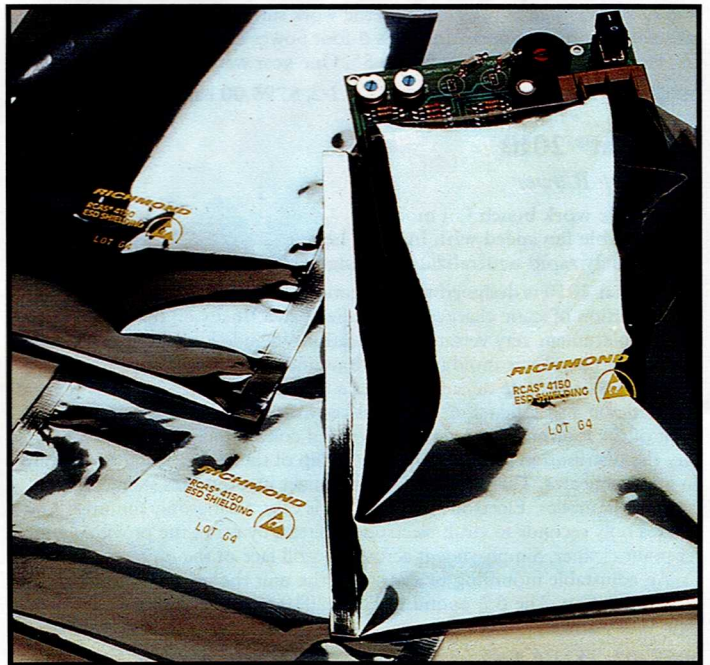
These bags meet the EIA-541 definition for static shielding/dissipative packaging. Choose from two styles in eight popular sizes. The 1910 bags utilize a dual-track closure system for easy opening and sealing. Choose from nine popular sizes packaged in boxes of 100 bags.



1910 Metal-In Static-Shielding Bags with Dual-Track Closure System

600X582	1910-1014 (10" x 14")	1-5,	\$36.00 ea.;	6-up,	\$33.50 ea.
600X591	1910-1216 (12" x 16")	1-5,	48.00 ea.;	6-up,	44.50 ea.
600X600	1910-1818 (18" x 18")	1-5,	74.50 ea.;	6-up,	69.00 ea.
600X540	1910-35 (3" x 5")	1-5,	9.75 ea.;	6-up,	9.00 ea.
600X551	1910-44 (4" x 4")	1-5,	9.75 ea.;	6-up,	9.00 ea.
600X562	1910-46 (4" x 6")	1-5,	11.25 ea.;	6-up,	10.50 ea.
600X574	1910-68 (6" x 8")	1-5,	17.00 ea.;	6-up,	15.75 ea.
600X579	1910-810 (8" x 10")	1-5,	25.50 ea.;	6-up,	23.50 ea.

Dimensions are inside measurements (W x L). Prices are per box of 100.



PCK-40 Prostat® Survey Kit

ESD Coordinators Kit

- Lightweight, low-cost kit replaces multiple units
- Smallest, most comprehensive ESD survey kit available
- Performs a wide range tests to ensure proper ESD control
- Easy-to-use instruments require minimum ESD skills and training

The new PCK-40 ESD Coordinators Kit is designed for periodic ESD checks to confirm ongoing performance of static-control products and materials. It requires minimum ESD skills or training and offers a broad range of ESD test capabilities in a compact format. This kit is perfect for beginning, maintaining or auditing your ESD program at low cost. It is designed to be an easy-to-use system that meets your day-to-day ESD survey requirements. Use it where simplicity and volume requirements prevail.

This helpful and inexpensive kit verifies your ESD controls to combat and help control static electricity in the sensitive environment. All easy-to-use instruments require little or no training. This combination replaces a variety of individual products valued at \$1500-\$2000 for a fraction of the cost. It performs a variety of ESD assessments including floors, work surfaces, equipment, chairs, carts, wrist straps, footwear, raw materials, production aids, packaging materials and other ESD control products.

The PSC-715 Static Locator is a non-contact meter that indicates electrostatic field voltage and polarity on charged surfaces. Model PSI-870 Surface Resistance/Resistivity Indicator is an LED-indicating, wide-range resistance measurement device with broad application flexibility. The durable PWS-610M Wrist Strap features adjustable two-way stretch knit cuff and heavy-duty but lightweight cord. Model PMT-872 Dual Function Wrist Strip/Footwear Checker and PFP-861 Footplate check single and dual conductor



wrist straps and footwear. The PTH-770 Hygro-Thermometer is an accurate, battery-operated temperature and humidity indicator. Model PMM-810 DMM is five meters in one for precise resistance measurements, continuity indication, capacitance, current measurement and much more. Instruments and operations manual are organized in a black plastic case. The 7-pound kit is 16.25" x 12" x 3.25". One-year warranty.



PCK-40 ESD Kit

043X7001-2, \$1290.00 ea.; 3-up, \$1230.00 ea.

IntelliStat™ 48

Overhead Ionizer

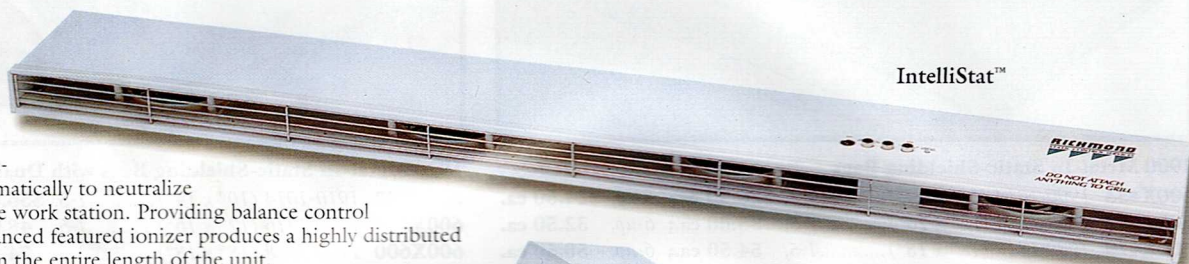
- Self-contained
- Self-balancing

The IntelliStat™ 48 self-contained, self-balancing ionizer operates automatically to neutralize electrostatic charges at the work station. Providing balance control with ease of use, this advanced featured ionizer produces a highly distributed curtain of air flowing from the entire length of the unit.

Recombination of ions is minimized due to the lack of airflow turbulence. The air curtain, combined with tight balance control, provides highly effective static neutralization. Control panel includes operator lockout keyswitch to protect tampering by unauthorized personnel with visual and audible alarms to indicate when the unit requires attention. IntelliStat 48 includes 12 sets of emitter pins (24 elements).

The enhanced unit is adaptable to different work positions. Two adjustable mounting brackets enable overhead suspension, mounting on a wall or shelf as well as placement on the work surface. Adjustments enable targeting of problem areas. Includes 6-foot power cord. The 10-pound IntelliStat 48 measures 48" x 2" x 6.5". One-year warranty.

606X450 IntelliStat 48.....1-2, \$795.00 ea.; 3-up, \$740.00 ea.



EndStat®



FSI

RICHMOND

EndStat® 2010

Benchtop Blower

- Versatile work bench fan model
- Adjustable fan speed with internal heater
- Extremely rapid neutralization of static charges

EndStat 2010 is designed for applications that require extremely rapid neutralization of static charges in a localized area. It sits on the work bench, making placement very versatile. Applications include ionization of electronic assembly areas, plastic molding operations and many more.

Using Steady State dc, a fan creates a focused airflow that rapidly neutralizes static on a specific target as well as controls static in the general area in front of the ionizer. An adjustable fan speed control enables the operator to vary the distribution of the ionized air. A flip of the switch instantly activates an internal heater. This work bench fan ionizer incorporates stainless steel emitter assemblies. Electrode replacement is easy, taking only minutes. And it takes only seconds to clean electrode emitters by using the provided emitter point cleaner. Simply slide it across the grill face of the unit.

An adjustable mounting bracket gives the unit the flexibility to be aimed in any direction. The 6.7-pound EndStat 2010 measures 10" x 6" x 6". One-year warranty.

606X302 ES2010 Benchtop Blower1-5, \$400.00 ea.; 6-up, \$372.00 ea.

FSI

Field Service Ionizer

- Compact portable fan model
- Self-contained blower
- Rapidly neutralizes static charges

This compact ionizer is the smallest self-contained ionizing blower available. Use the FSI in electronic assembly and molded-extruded plastics applications. It is ideal for use in field service applications, can be mounted on production equipment or used as a stand-alone bench top blower.

Steady State dc electronics, replaceable etched tungsten electrodes and a quiet fan assembly provide rapid neutralization of static charges. The gentle airflow from the ionizer's small muffin fan eliminates operator discomfort and solderability problems typically associated with larger fan-driven ionizers. The FSI's all-metal grounded housing totally eliminates the possibility of field-induced charging.

Portable Model FSI takes up only 8 square inches of work surface and yet the focused flow of ions reduces a 1000-volt charge to less than 100 volts in under 20 seconds at a distance of 3 feet. An included tilt-mounting bracket permits easy mounting to production equipment or work benches. The 1.75-pound FSI is 6" x 4" x 2". One-year warranty.

606X370 FSI Field Service Ionizer.....1-5, \$295.00 ea.; 6-up, \$275.00 ea.





Model 709

Static Sensor

- Accurate LCD indicator
- User-selectable range settings
- Battery operated

Model 709 from 3M is an easy-to-use, hand-held static sensor that measures static voltages on objects and surfaces. Voltage changes are quickly displayed on the easy-to-read digital LCD. Model 709 has two range settings that can be expanded by changing the distance between the target and the static sensor. The low range measures up to 1990 volts, and the high range goes up to 19,000 volts.

Simply zero the sensor by turning it on to the Lo position and depress the battery/zero switch until the display reads 000. At a distance of about 10 inches, point the sensor toward the object or surface to be measured. If the sensor is overranged (display reads 1), switch to Hi range and re-zero. Move the sensor toward the object while observing the display. Without overranging the meter, continue moving the sensor toward the object until a minimum distance of 1 inch is reached. The static voltage is equal to the meter value multiplied by the number of inches between the sensor and the object.

Model 709 Specifications

Voltage Range	0.00-1990 1990-19,900
Accuracy	10%
Display	LCD

Model 709 is powered by a standard 9-V battery. Accuracy is +10%. A battery test displays the battery voltage level on the digital readout with provisions for analog recorder output (via two output jacks). This feature is invaluable for remote monitoring and permanent recording. The 7-ounce unit measures only 4.38" x 2.63" x 1.63". One-year warranty.

600X065 Model 709 Static Sensor.....1-5, \$502.00 ea.; 6-up, \$477.00 ea.



Model TSC

Wrist Band and Heel Strap Tester

- Dependable and easy to use
- Pass tone is easy to hear
- Visual signal indicates low or high fail

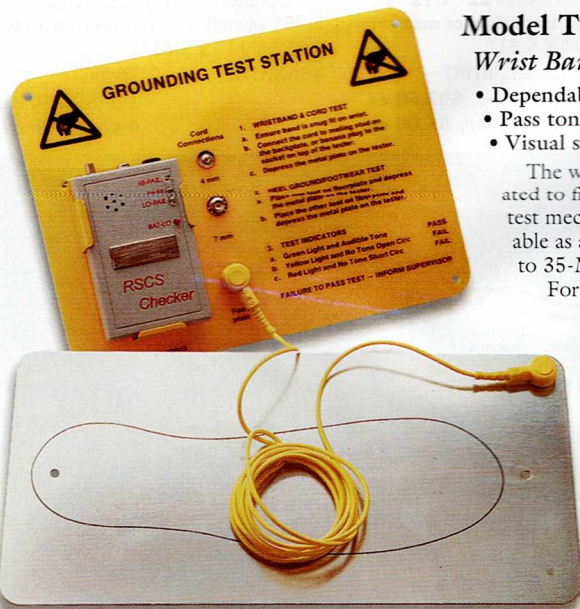
The wrist strap and heel grounder tester system was created to fill a growing demand for a dependable, easy-to-use test mechanism for personnel grounding devices. It is available as a 750-k to 10-M Ω tester (U.S. standard) and 900-k to 35-M Ω tester (European standard).

For wrist strap testing, place strap on wrist, connect grounding cord to tester and touch contact plate on tester. To test heel or toe grounder, strap grounder to shoe, step on metal footplate and touch contact plate on tester. Easy-to-hear tone indicates pass; visual signal indicates low or high fail. The wrist band tester may be hand held or wall mounted with the backplate sign. Heel and toe grounder testing require footplate.

Model TSC operates on a 9-volt cell (PP3).

The power indicator lights red for low battery. Connections include 7 mm, 4-mm banana socket and 6-mm pillar for coil cord clip connection. The gray unit is 3.75" x 2.5" x 1" and weighs 4.5 ounces including battery.

606X657 TSC Tester.....1-5, \$220.00 ea.; 6-up, \$209.00 ea.



TSC Specifications

U.S.A. Parameters

Pass Level	750 k-10 M Ω , green light and audible tone
Low Fail	<750 k, red light no tone
High Fail	>10 M Ω , yellow light no tone

European Parameters

Pass Level	900 k-35 M Ω , green light and audible tone
Low Fail	<900 k, red light no tone
High Fail	>35 M Ω , yellow light no tone

Connections 7mm, 4-mm banana socket, 6-mm pillar for coil cord clip connection

TI-400

Digital Static Field Locator

- Affordable and accurate
- Test ionization balance functions and static decay
- Measure static charge voltage

The new TI-400 Digital Static Field Locator is ideal for use in the electronics industry to test ionization balance functions and static decay. Also use this device in manufacturing environments to measure charges coming off of equipment such as converters, printing presses, etc. It measures static charge voltage (to a maximum of 2 inches) without making contact with the material being tested.

This handy, compact instrument measures the static potential of a charged object from a short distance and digitally displays readings. It performs the same tasks as equipment costing as much as \$8000 with dependable accuracy, providing 3.5-digit display

RICHMOND

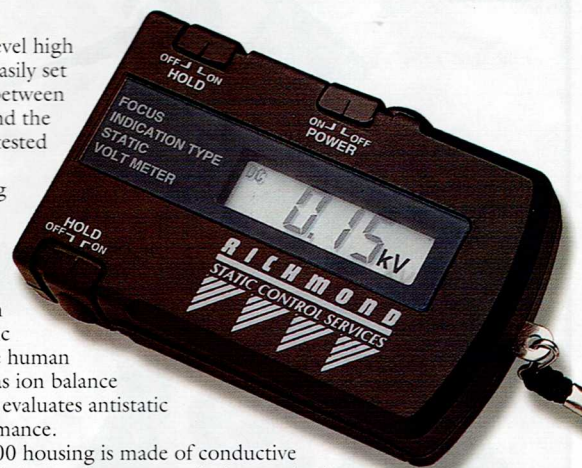
TI-400 Specifications

Voltage Range	0.00- \pm 19.99 kV
Accuracy	\pm 5% rdg., \pm 2 digit, 10-V resolution
Measuring Distance	Maximum 2" (50 mm) between TI-400 and object to be measured; displays both polarities
Power Source	DC 1.5 V; one alkaline UM-3 2 battery lasts 7.5 hours in continuous operation
Operating Temperature	0-+40° C
Sensor	Stabilized to read accurately in ionized areas

and 10-volt level high resolution. Easily set the distance between the TI-400 and the object being tested for optimum accuracy using the unit's red light. It also includes an ionizer plate adapter which measures static energy on the human body as well as ion balance in the air and evaluates antistatic device performance.

The TI-400 housing is made of conductive plastic. Slightly larger than a pager, it features both right- and left-handed indicator hold switches. Includes alkaline battery, cord and carrying case. The unit is 4" x 2.5" x .75" and weighs 4 ounces with battery.

606X640 TI-400 Digital Locator.....1-5, \$695.00 ea.; 6-up, \$660.00 ea.

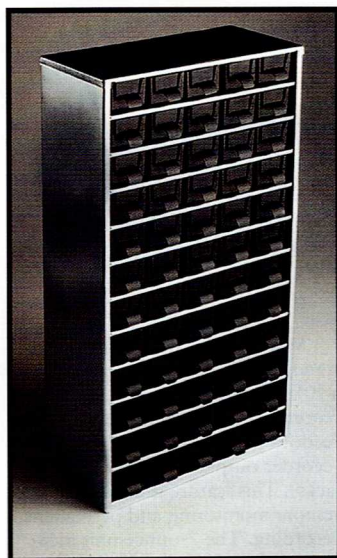


Flambeau

Conductive Storage Cabinets

Protect MOS, CMOS, integrated circuits, high-density memory chips, precision resistors and ESDS components, prints and equipment from static damage. Flambeau conductive products will bleed off any static charge at a safe, controlled rate when properly connected to an earth ground. Flambeau has developed a special design for these electrically conductive storage systems in accordance with the guidelines of DOD-HDBK-263.

Each Flambeau conductive cabinet comes with a ground cord that is equipped with a 1-megohm resistor. These cabinets make very effective storage units for your static-controlled work environment. Choose from three sizes. *Shipped surface freight only.*



Model 3060C
60-Drawer Cabinet

Cabinet measures 22" x 12" x 5.75" overall. Each drawer measures 1.38" x 2" x 5.31".

466X3603060C
1-5, \$92.50 ea.
6-up, 85.00 ea.



Model 3016C
16-Drawer Cabinet

Cabinet measures 22" x 12" x 5.75" overall. Each drawer measures 2.25" x 5.31" x 5.31".

466X3203016C
1-5, \$92.50 ea.
6-up, 85.00 ea.



Model 3080C
Eight-Drawer Cabinet

Cabinet measures 22" x 12" x 5.75" overall. Each drawer measures 2.25" x 11" x 5.31".

466X3703080C
1-5, \$92.50 ea.
6-up, 85.00 ea.

Conductive Storage Bins

Flambeau's conductive storage bin system was designed to aid the production assembler and the depot repair technician. By utilizing different sized detachable bins, this storage system is the most flexible while maintaining the level of static protection required for today's sensitive components. Each system comes with a conductive bin stand, eight each #3006 (4.88" x 2" x 5.13") bins, four each #3007 (4.88" x 3" x 6.63") bins, four each #3008 (4.88" x 3.88" x 8.88") bins and a grounding cord with a 1-megohm resistor. Extra bins may be ordered separately. *Shipped surface freight only.*

466X380 3100C Complete Storage Sys.1-5, \$123.00 ea.; 6-up, \$113.00 ea.
466X316 3009C Conductive Stand Only..1-5, 68.00 ea.; 6-up, 63.00 ea.
466X310 3006C Small Bins Only1-23, 2.75 ea.; 24-up, 2.40 ea.
466X312 3007C Medium Bins Only.....1-23, 4.75 ea.; 24-up, 4.10 ea.
466X314 3008C Large Bins Only1-23, 7.75 ea.; 24-up, 7.00 ea.



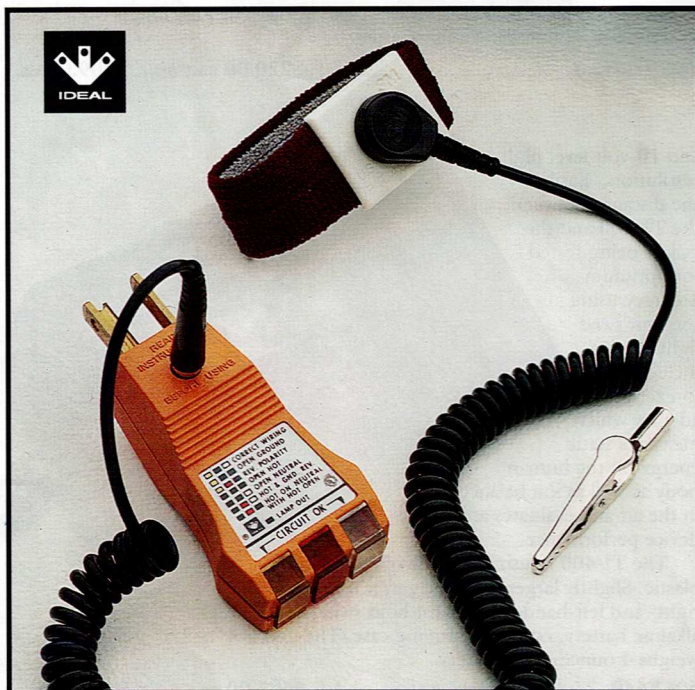
Stat-gard™ Grounding Plug

Now you can improve service efficiency by grounding static discharge through a proven ground. Ideal's Stat-gard grounding system not only tells you if you have a proper ground, but it also allows you to plug your Stat-gard into the ac receptacle. It then tells you if you have a proper ground and if the receptacle is actually wired correctly. If it's all correct, just plug your ground cord into the Stat-gard, attach your wrist band, and be assured that you're properly grounded before you begin working on your equipment.

The Stat-gard not only assures a proper ground, but it is a complete receptacle analyzer as well. It tests all three-wire, 120-V circuits for: open ground, open neutral, open hot, hot on neutral and hot on open, reverse polarity and hot and ground reversed. Bright long-life neon lamp indicators feature wrap-around lens covers to provide visibility from all angles. Its convenient, push/pull shape makes it very easy to use.

Ideal's Stat-gard works in combination with most all popular wrist straps that utilize banana-type connectors (including all 3M models). *Wrist strap not included.*

370X438 Stat-gard (61-038)1-11, \$23.95 ea.; 12-up, \$22.50 ea.



PB-503

ProtoBoard® Design Station

Global Specialties' Model PB-503 is a complete design workstation including instrumentation, breadboarding and a rugged dc-regulated triple power supply. It contains multiple features in one complete test instrument and is ideal for analog, digital and microprocessor circuits.

The instrumentation features a 100-kHz function generator with sine, square and triangle waveforms plus a TTL output for generating clock pulses. Additionally, the PB-503 is supplied with two digital pulsers operated by debounced push-button switches and eight logic state indicators that function as individual logic probes. The breadboarding area has a total of 2520 uncommitted tie points, enough space for circuits containing 24 ICs of 14 pins or the equivalent. Plus the sockets feature an unlimited lifetime guarantee. The power supply offers three dc-regulated supplies, one fixed at +5 V dc and two variable from ± 1.3 to ± 15 V dc. All three supplies are short-circuit protected, automatically current limiting the output to a safe level.

This exceptional combination of equipment makes the PB-503 a significant improvement and value over the individual components, particularly for design engineers and high technology applications including laboratories, test benches and classrooms. The PB-503 measures 6.5" x 16" x 11.5", weighs 4 pounds and is enclosed in a high-impact molded case.

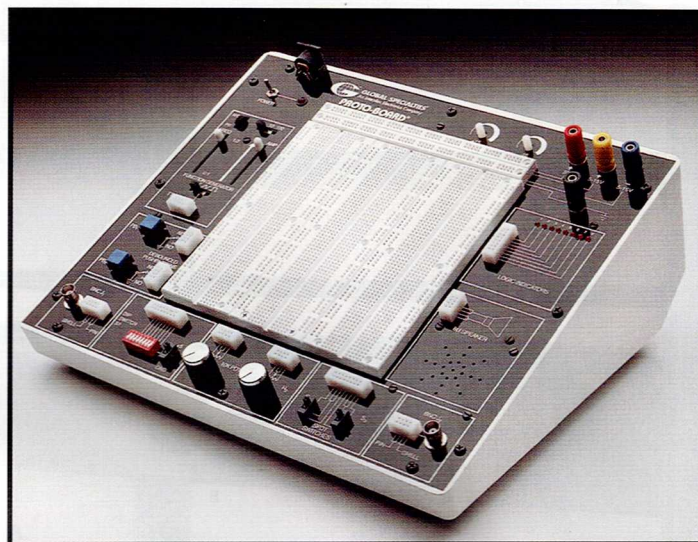
190X520 PB-503 Station1-5, \$299.00 ea.; 6-up, \$281.00 ea.

PB-203A

Powered ProtoBoard® System

The PB-203A from Global Specialties combines the utility of a ProtoBoard with a highly capable regulated dc power supply. The breadboarding area has a total of 2250 uncommitted tie points, enough space for circuits containing up to 24 ICs of 14 pins (equivalent to PB-103). The solderless socket and bus strips allow you to build faster than you can sketch. The PB-203A features a 5-V dc, 1-A power supply short-circuit protected to limit the output current to a safe level automatically. Additionally, it features separate +5.5 to 18 V dc/-5.5 to 18 V dc power supplies capable of 500 mA at 15 V dc and factory-preset power to ± 15 V dc with the voltages independently adjustable via an internal screwdriver adjustment. The PB-203A ProtoBoard System measures 9.8" x 6.6" x 3.3", weighs 5.5 pounds and comes with a complete instruction manual.

190X510 PB-203A System1-5, \$183.00 ea.; 6-up, \$172.00 ea.



Solderless Breadboarding Systems

Solderless Breadboards allow easier and faster designing, developing and testing of electronic circuits. Components and wire leads can be inserted and removed without causing any damage, allowing circuit changes to be made in minutes. By utilizing a simple flat spring clip behind a row of holes in an insulated carrier, a component or wire lead can be inserted into this hole and tied in to any leads plugged into the same circuit.

Arrays of solderless sockets and bus strips emulate standard pc layout practice while permitting the direct insertion of DIP components with virtually any center channel spacing. Components may plug directly into individual socket strips. If they are wider than 0.6 inches (as with LCD displays, for example), they may straddle bus strips.

Universal 0.1 by 0.1 inch contact grid spacing permits use of most modern active and passive components, both integrated and discrete. Careful layout permits use of our solderless breadboards in applications to more than 50 MHz. Nickel-silver contact clips assure solid, low-resistance connections.

Because the oxides of nickel-silver are also conductive, these connections may remain indefinitely, permitting either temporary or semi-permanent use of a circuit built on a ProtoBoard. The versatility of the ProtoBoard design recommends it for design, test fixture, quality control, prototyping, evaluation, inspection and custom circuit applications. Choose from five sizes.

PB-10: IC capacity of 8*, 840 tie points, three binding posts, plastic backplate. Measures 7" x 4" x 1.4".

190X480 PB-10 ProtoBoard1-5, \$20.00 ea.; 6-up, \$18.00 ea.

PB-102: IC capacity of 12*, 248 terminals, 1240 tie points, one binding post. Measures 7.4" x 4.5" x 1.4".

190X494 PB-102 ProtoBoard1-5, \$42.00 ea.; 6-up, \$37.00 ea.

PB-103: IC capacity of 24*, 450 terminals, 2250 tie points, four binding posts. Measures 9" x 6" x 1.4".

190X496 PB-103 ProtoBoard1-5, \$65.00 ea.; 6-up, \$58.00 ea.

PB-104: IC capacity of 32*, 612 terminals, 3060 tie points, four binding posts. Measures 9.8" x 8" x 1.4".

190X500 PB-104 ProtoBoard1-5, \$75.00 ea.; 6-up, \$67.00 ea.

PB-105: IC capacity of 48*, 912 terminals, 4560 tie points, five binding posts. Measures 9.2" x 11" x 1.4". This is the largest ProtoBoard available.

190X505 PB-105 ProtoBoard1-5, \$105.00 ea.; 6-up, \$94.00 ea.

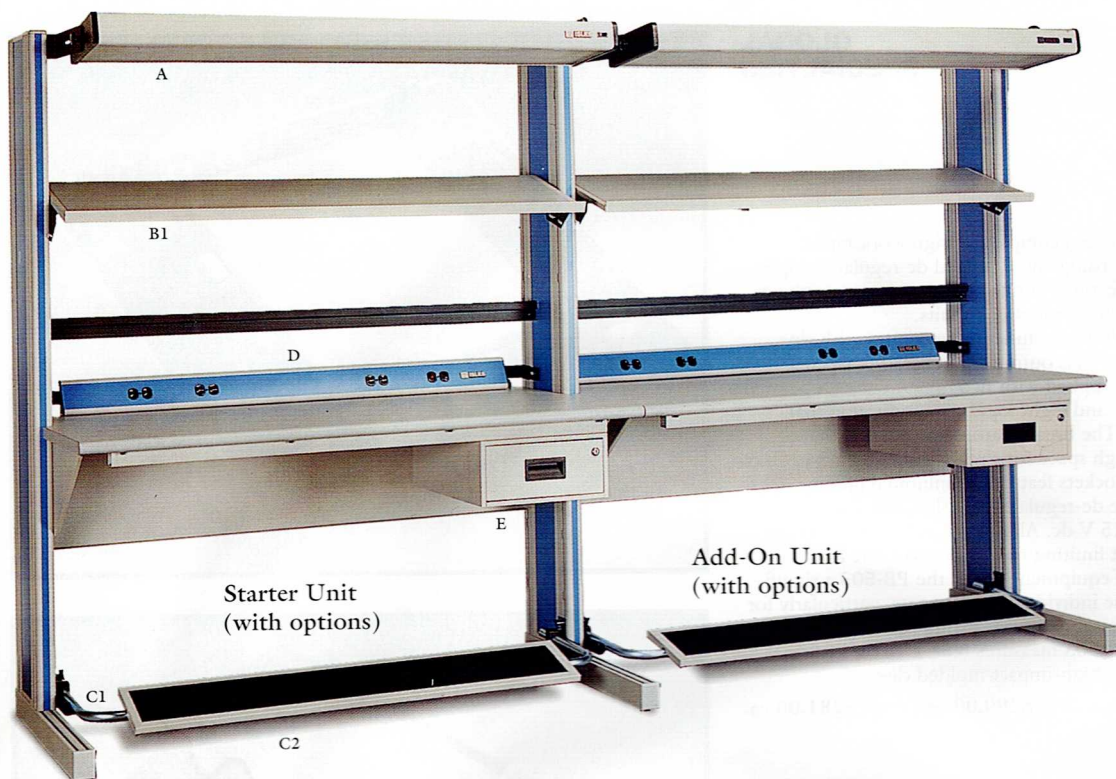
*Assumes 14-pin ICs.

WK-1 Wire Jumper Kit

This complete kit is the ideal work mate for all Global solderless breadboards. It contains pre-cut/pre-stripped/pre-formed AWG #22 insulated solid hookup wire in color-coded lengths, all in a handy compartmental plastic case. Includes 25 pieces in each of 14 lengths (.1"-5.0"). Length does not include .25" ends, stripped and bent at 90°.

190X595 WK-1 Jumper Kit\$15.00 ea.

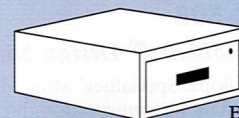




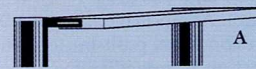
Starter Unit
(with options)

Add-On Unit
(with options)

Accessories



Drawer with Lock



Light Fixture



Adjustable Shelf

Shipped Surface
Freight Only



Dimension 4 Work Benches

Modular Work Stations

Durable construction, ergonomics and contemporary design make Dimension 4 modular work stations the perfect choice for technical task centers ranging from the laboratory to slide line assembly lines. Fully adjustable, they enable each worker to set up footrests, shelving and other components for personal comfort and efficiency. Two-piece, 12-inch-wide column with weight-distributing support groove provides secure leverage point for work surface and supports a wide choice of options. Heavy-gauge steel is used for support beams, shelf risers, drawers and all weight-bearing elements.

Starter Unit consists of 30" x 60" x 72" bench assembly with two uprights only. It is shown with optional (A) 60" light fixture, (B1 or B2 ESD) 60" x 12" adjustable shelf, (C1) footrest tube assembly, (C2) non-skid footrest pan, (D) 60" electrical channel assembly and (E) 6" locking drawer. ESD version features 3M static-dissipative laminate that meets all industry ESD requirements. Add-On Unit includes additional 30" x 60" x 72" bench assembly with single upright only. It is pictured with optional light, shelf, drawer, footrest and electrical channel. ESD version available. Any combination of options is available separately. Attach as many Add-On Units plus additional drawers and/or shelves as required.

Choose standard (dove grey) or static-dissipative (grey) laminate with grounding system to ensure static-safe working environment. Baked-on powder epoxy paint is textured grey with Apollo blue trim. Attractive, durable finish will provide years of dependable service. Work surface has 180° rolled front edge and sealed backing to eliminate flaking. Heavy wall round tubing footrest provides comfort. Attach ergonomic footrest pan with non-skid sur-

face for added support. Mount 6" x 15" x 18" heavy-gauge steel drawer at left, right or stacked to create multiple units. Ball bearing slides ensure smooth travel. Lock and key secure valuables. Mounting hardware included.

All benches shipped knocked down via surface freight. Assembly is quick and easy. Each component includes all necessary hardware and complete assembly instructions. One-year warranty.

D4 Standard Benches

777X161	Standard Starter Unit.....	\$704.00 ea.
777X166	Standard Add-On Unit.....	470.00 ea.

D4 ESD Benches

777X261	ESD Starter Unit.....	\$844.00 ea.
777X266	ESD Add-On Unit.....	610.00 ea.

Optional Accessories

(A)	777X075	Light Fixture, 60" (w/o tube)	\$236.00 ea.
(B1)	777X050	Adjustable Shelf, 60" x 12"	73.00 ea.
(B2)	777X250	Adjustable ESD Shelf, 60" x 12"	136.00 ea.
(C1)	777X060	Footrest Tube Assembly.....	64.00 ea.
(C2)	777X065	Footrest Non-Skid Pan Assembly.....	57.00 ea.
(D)	777X080	Multi-Electrical Channel, 60".....	124.00 ea.
(E)	777X120	6" Locking Drawer.....	128.00 ea.

Series 45 Stools

Ergonomic Seating for Bench-Height Comfort

Series 45 bench-height stools are priced far below the competition, yet they still offer fine quality, durable, ergonomically correct seating. Seats and backs are ergonomically contoured for hours of comfort. The 2.25-inch thick quality single-density foam provides extra years of service. Each 25.5-inch five-prong base is constructed of black nylon reinforced with fiberglass for strength. Urethane dual-wheel casters make movement easy. All structural components meet ANSI-BIFMA and GSA standards.

The two standard models' simple ergonomic adjustments include automatic back cushion tilting, seat height by gas lift plus seat length, back cushion height and foot ring height by hand wheel. Levers on the two deluxe versions allow for



LISSNER

Shipped Surface
Freight Only



easier control. The addition of standard seat-tilt control provides seat and back cushion tilting by lifting a single lever.

Standard and deluxe styles are upholstered in Scotchgard™-treated blue fabric with rubber-trimmed seat backs. Both are also available in static-control versions. Seat size is 18" W x 17" D, and seat height is adjustable from 21" to 31". Back cushion size is 13" H x 16" W. Five-year warranty.

CP45-5-F1-3 Standard Bench-Height Stool

849X7001-5, \$212.00 ea.; 6-up, \$195.00 ea.

CP45-5-FC3-3 Standard Static-Control Stool

849X7201-5, \$264.00 ea.; 6-up, \$243.00 ea.

CP45-5-ST-F1-3 Deluxe Bench-Height Stool

849X7501-5, \$258.00 ea.; 6-up, \$238.00 ea.

CP45-5-ST-FC3-3 Deluxe Static-Control Stool

849X7701-5, \$310.00 ea.; 6-up, \$285.00 ea.

NEXT-DAY DELIVERY
ONLY \$14.95!





IMMEDIATE DELIVERY!

Standard Bench Series

Work Benches

- Adjustable heavy-duty floor glides
- Choose standard or static-dissipative ESD top
- Up to 1000 pounds distributed weight on worksurface
- Low-glare white color countertops

IAC workstations are used extensively in the electronics industry for assembly, test and repair areas. They are also popular in scientific and engineering laboratories as well as technical schools and colleges. These engineered products increase productivity, perform dependably and can eliminate costly production bottlenecks. Work benches and accessories are of the highest quality structural integrity, aesthetics and modularity. They maintain a professional appearance and provide years of continued satisfaction.

Each bench comes ready to assemble in mere minutes with the included tool. No drilling is required. All attachment points are inserted with EZLocks inserts for easy assembly and high-strength connections. Leg assemblies are made of heavy-gauge 2" x 2" tubular steel and support up to 1000 pounds of distributed load. Attach them to steel beams to form a rigid, full perimeter work surface support frame. All metal components have a baked-on sky blue (cleanroom approved) powder epoxy paint finish.

Worksurface tops are made of 1.25" thick, high-density particle board. They are laminated on top and sides with industrial-grade, low-glare, white plastic formica. Standard tops have square edges on all sides. Static-dissipative (ESD) tops come with rolled front edges, surface resistivity of 10^6 - 10^9 ohms/sq., dual ground studs and 10-foot ground cords.

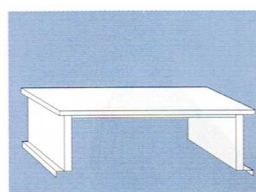
Each bench measures 30" high with standard leg leveler floor glides. Choose from three sizes: 30" x 60", 30" x 72" and 36" x 72" in both standard and static-dissipative (ESD) models. One-year warranty.



Turn a basic bench into an option-loaded technician's bench by adding accessories to fit your needs. Pre-drilled holes with steel threaded inserts make add-ons easy. Heavy-gauge steel cabinets and drawers may be mounted left, right or stacked. Choose from 12" (H) x 15" (W) x 18" (D) single cabinet with door (A), 12" (A) and 6" (B) single drawers. Four-duplex electrical channels (C) come in 60" and 72" lengths. The pre-wired electrical panel (D) features four 115-V ac/15-A duplex outlets plus control switch and power light. Chrome-plated adjustable footrests (E) come in 60" and 72" lengths. Heavy-duty tubular design helps prevent fatigue from dangling legs.

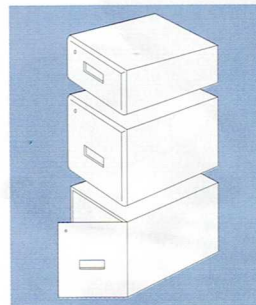
A 48" single-tube, fluorescent undershelf light (F) projects light over entire work surface. Includes on-off switch, outlet and 6-foot three-wire power cord. Standard and static-dissipative instrument shelves (G) come in two lengths. These 15" deep surfaces are supported by two 18" high risers. They support 500 pounds of distributed weight. Locks (H) are keyed differently for security. One-year warranty. Shipped surface freight only.

777X400	30" x 60" Stock Bench	\$338.00 ea.
777X410	30" x 72" Stock Bench	368.00 ea.
777X420	36" x 72" Stock Bench	403.00 ea.
777X300	30" x 60" ESD Stock Bench	494.00 ea.
777X310	30" x 72" ESD Stock Bench	548.00 ea.
777X320	36" x 72" ESD Stock Bench	612.00 ea.

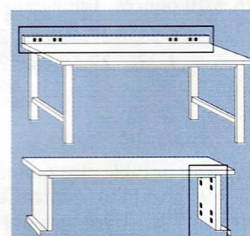


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Only

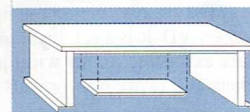
15" x 60" x 18" H Shelf	777X560	\$178.00 ea.
15" D x 72" x 18" H Shelf	777X570	\$192.00 ea.
15" D x 60" x 18" H ESD Shelf	777X360	\$266.00 ea.
15" D x 72" x 18" ESD Shelf	777X370	\$295.00 ea.



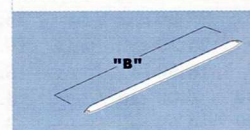
Single Cabinet w/ Door (12" x 15" x 18")	777X170	\$144.00 ea.
Single Drawer 12" (12" x 15" x 18")	777X180	\$167.00 ea.
Single Drawer, 6" (6" x 15" x 18")	777X175	\$117.00 ea.
Drawer/Cabinet Lock	777X390	\$12.00 ea.



Electrical Channel, 60" (4 duplex)	777X460	\$98.00 ea.
Electrical Channel, 72" (4 duplex)	777X470	\$110.00 ea.
Switched Electrical Panel/Instrument Shelf	777X480	\$76.00 ea.



Undershelf Light, 48" (1-Tube)	777X550	\$87.00 ea.
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Adjustable Footrest, 60"	777X500	\$56.00 ea.
Adjustable Footrest, 72"	777X510	\$56.00 ea.



Electrical Tapes

The 3M 35 Series of premium-grade, flame-retardant vinyl electrical tapes is perfect for color coding. Weather-resistant tapes offer superior cold-weather handling capabilities and resist moisture for splicing. Super 88 tape is heavy-duty 8.5 mil while the others are 7 mil. Model 33+D comes in a handy dispenser. These tapes are $\frac{3}{4}$ " x 66'.

Stock No.	Description	Price/Roll		
		1-24	25-99	100-199
598X400	88 Super.....	\$4.26	\$3.70	\$3.33
598X205	33+ Standard.....	3.85	3.35	3.02
598X200	33+D with Dispenser.....	4.30	3.74	3.37
598X300	35 Blue.....	3.75	3.29	2.96
598X310	35 Green.....	3.75	3.29	2.96
598X315	35 Orange.....	3.75	3.29	2.96
598X320	35 Red.....	3.75	3.29	2.96
598X325	35 White.....	3.75	3.29	2.96



3M



Foil Shielding Tapes

The foil tape kit is a unique way to have a variety of foil shielding tapes conveniently at hand for design or prototype needs. A compact dispenser box serves as a desktop reference with basic technical information on each tape including product number, backing and adhesive types plus thickness, adhesion, resistance and shielding effectiveness. This kit contains eight rolls: 1170, 1181, 1182, 1183, 1194, 1245, 1267 and 1345.

Tapes are also available individually. The 1170 is aluminum smooth-backed for cost-effective EMI protection in OEM shielding and static grounding applications. Both 1181 and 1183 are copper foil tapes. The 1183 is tin plated while the 1245 has embossed copper foil shielding. The 1267's embossed aluminum pattern provides a reliable conductive-through adhesive system. Another embossed model is the 1345 tin alloy copper foil tape which offers a conductive-through adhesive system. Each roll measures 1" x 18 yards.

598X100	Foil Tape Kit	\$52.00 ea.
598X410	1170 Tape (1).....1-11,	\$44.50 ea.; 12-up, 41.00 ea.
598X420	1181 Tape (1).....1-11,	39.50 ea.; 12-up, 36.50 ea.
598X430	1183 Tape (1).....1-11,	42.00 ea.; 12-up, 39.00 ea.
598X450	1245 Tape (1).....1-11,	34.00 ea.; 12-up, 31.50 ea.
598X455	1267 Tape (1).....1-11,	37.50 ea.; 12-up, 34.50 ea.
598X470	1345 Tape (1).....1-11,	37.50 ea.; 12-up, 34.50 ea.

Safety Tapes

Durable vinyl tapes provide exceptional versatility in meeting your needs for lane marking, identification, masking and sealing. Made with specially formulated rubber adhesive, they code bright and seal tight. The 5700 comes in black/white stripes, and the 5702 is black/yellow striped. These tapes can be stretched, molded, formed, pressed or cut to fit. This provides excellent conformability to irregular shapes and surfaces plus sharp consistent results. They also remove quickly and cleanly. Whether for permanent or temporary applications, tapes stay where they are put. They provide maximum protection against abrasion, moisture, weathering and solvents.

Vinyl-backed tapes comply with OSHA and ANSI standards for identification of hazardous areas, fire lanes and safety equipment. Marking a hazardous area with tape is easier and less time consuming than masking and painting, plus tape is safer and easier to store than solvent-based materials. Marking an area with such durable and bright tape assures that it gets noticed and stays noticed. Tape backing thickness is 4 mils with total tape thickness of 5 mils. Tensile strength in pounds per inch is 15 pounds, and adhesion ounces per inch is 20 ounces. Temperature range is 32° F to 180° F.

598X500	5700 Vinyl Tape (Black/White).....	1-23, \$27.50 ea.; 24-up, \$25.50 ea.
598X510	5702 Vinyl Tape (Black/Yellow).....	1-23, 27.50 ea.; 24-up, 25.50 ea.



Wire Marking Tapes

These tapes are ideal for marking and labeling any wire or cable plus motor panels, control panels, sub-assemblies and parts. Compact and convenient STD-0-9 and STD-C ScotchCode™ Wire Marker Tape Dispensers feature easy cut-off and 10 refillable compartments. STD-0-9 includes one roll of each number 0-9, and STD-C includes one roll of each color. Refills are available — contact our Sales Department. The SWD Write-on Tape Dispenser contains 250 $\frac{3}{4}$ " x $\frac{1}{8}$ " vinyl tape markers (white) with $\frac{3}{4}$ " x $\frac{1}{16}$ " write-on area and stable writing surface. SWD-R is a refill roll for the SWD. ScotchCode™ Marking Pens SMP and SMP-R feature extra-fine points with quick-drying, water-resistant ink. Use them on write-on tape markers and other non-porous surfaces.

599X130	STD-0-9 Dispenser with Tape.....	1-23, \$27.00 ea.; 24-up, \$25.00 ea.
599X129	STD-C Dispenser with Tape.....	1-23, 27.00 ea.; 24-up, 25.00 ea.
599X140	SWD Dispenser with Tape.....	1-9, 21.25 ea.; 10-up, 19.50 ea.
599X141	SWD-R Marker Refills.....	1-9, 16.50 ea.; 10-up, 15.25 ea.
599X120	SMP Black Marking Pen.....	1-49, 4.00 ea.; 50-up, 3.75 ea.
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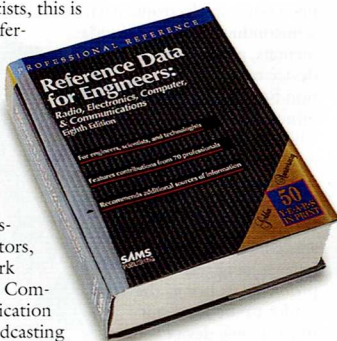


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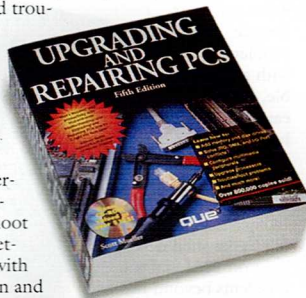
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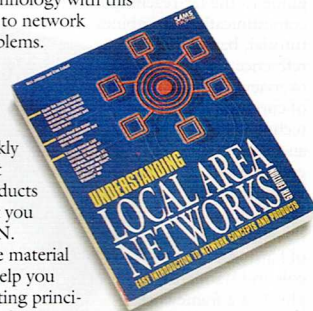
Upgrading and Repairing PCs: The most comprehensive, up-to-date PC technical support reference available. No matter what kind of PC you have, fix it right the first time. Assess your system, install hardware and troubleshoot problems. Learn how to add memory and disk drives; solve IRQ, DMA and I/O port conflicts; configure multimedia peripherals; upgrade processors; plus troubleshoot video, audio and network cards. Filled with detailed information and specifications for every component in your PC including major peripherals. CD-ROM included. Softbound, 1394 pages.

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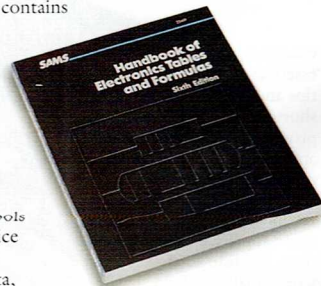
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Handbook of Electronics Tables and Formulas:

This classic text is ideal for anyone interested in the field of electronics who needs a ready reference to mathematical tables and electronics formulas. It contains computer programs calculating many electrical and electronic equations and formulas, laws, constants and standards, symbols and codes, service and installation data, design data, weights and measures conversions, table of elements, temperature scales and much more. Softbound, 280 pages.

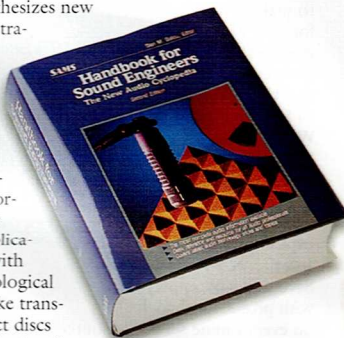
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Handbook for Sound Engineers:

New audio cyclopedia is the standard desk reference for sound and acoustical technology. With emphasis on detail, it synthesizes new technology and traditional sound mechanics into a single, convenient audio library. It presents proper installation techniques and performance ideals for virtually any application. Updated with the latest technological advancements like transformers, compact discs and MIDI, this is the all-in-one guide for completing any audio engineering task. Hardbound, 1400 pages.

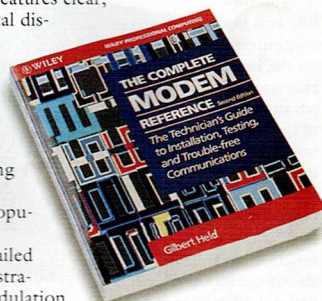
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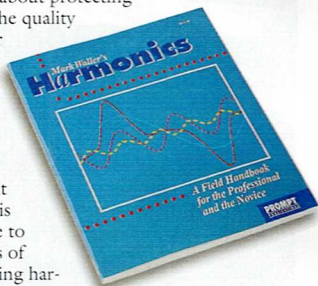
Comprehensive revised edition is an indispensable resource for buying, testing, installing and troubleshooting modems. Features clear, concise technical discussions and guidelines with handy tables, checklists and summaries. Troubleshooting tips and techniques cover popular modulation standards. Detailed tables with illustrations cover modulation techniques and AT commands. Explores modem compatibility factors. Includes 25-point modem buying checklist. Softbound, 412 pages.

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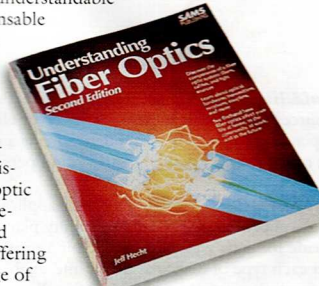
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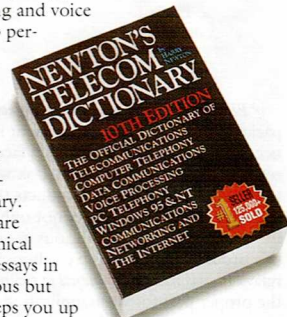
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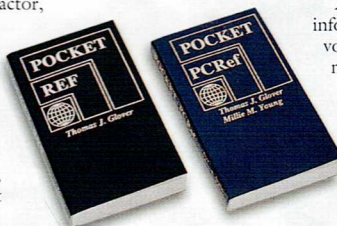
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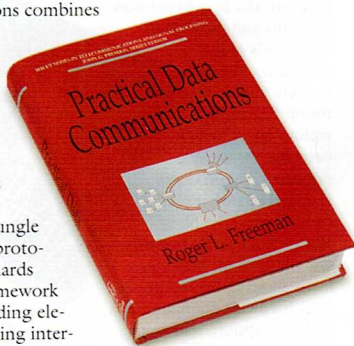


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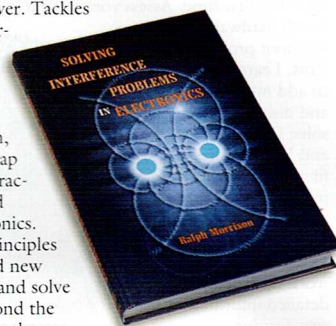


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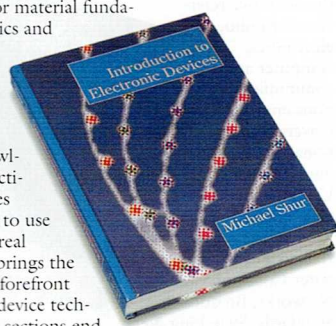
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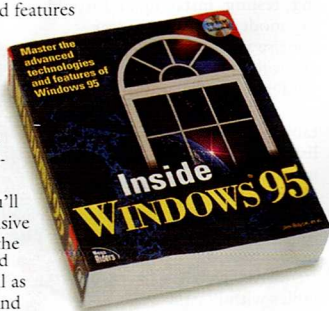
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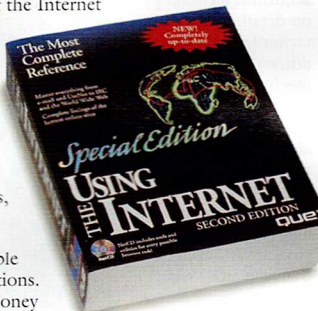
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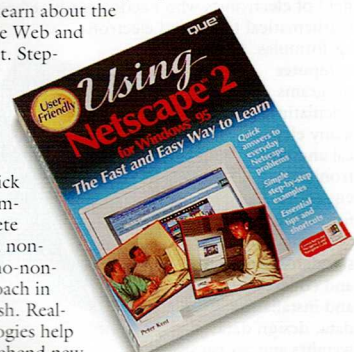
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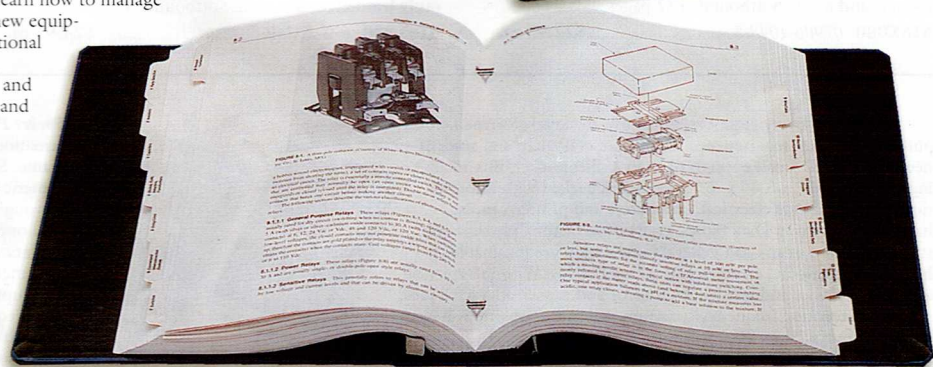
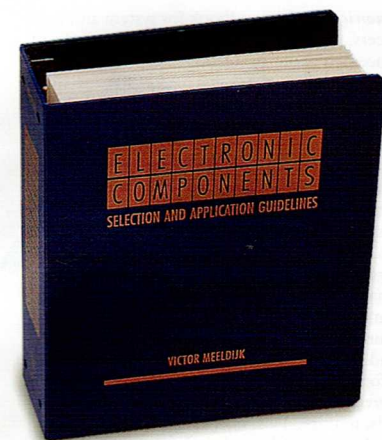
Parts selection includes not only choosing the proper part that will work reliably for your application but also using devices that meet various governmental and safety agency approvals. Cost and availability play significant roles in this process. Hundreds, even thousands, of choices can be made for each type of device, be it a resistor, capacitor or relay. *Electronic Components* explains the differences between each type of device available and enables you to select the proper part for your application. Includes background information on component origins. You get data on current sales where available, although it may differ depending on which market analysis data you examine.

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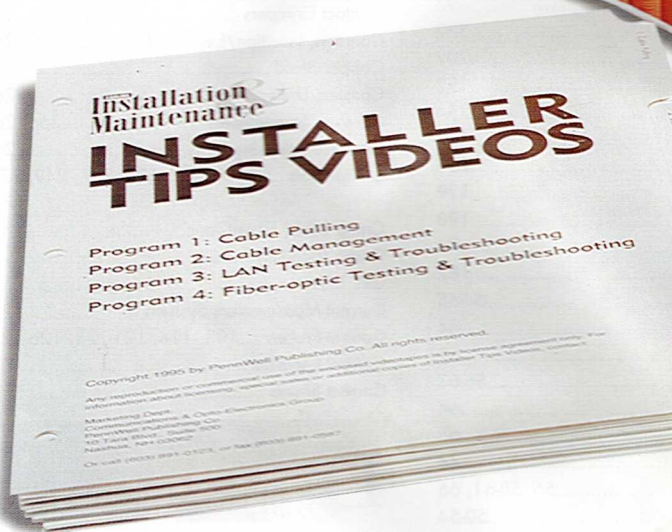
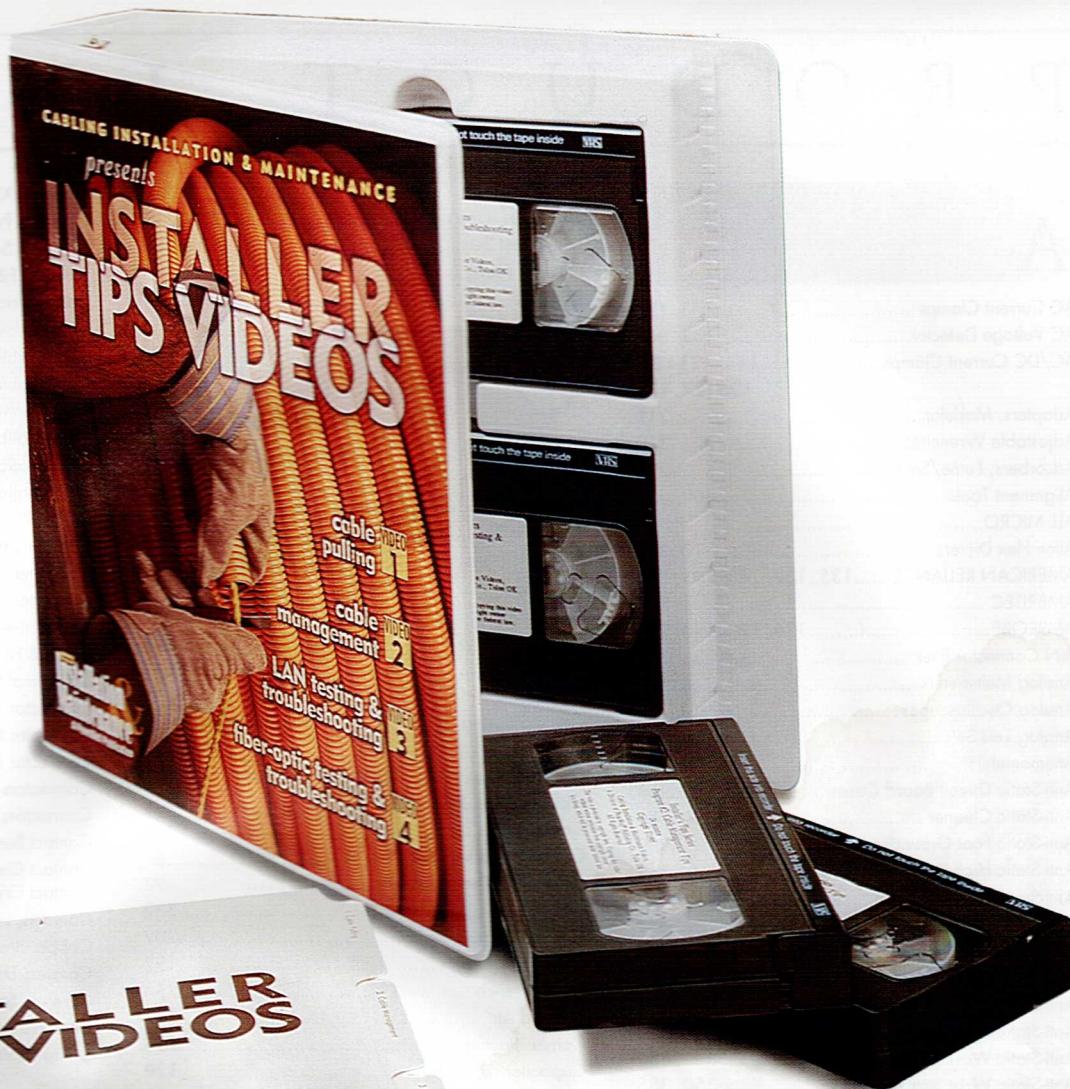
Chapters include The Parts Selection Process; Resistors; Capacitors; Chokes, Coils, Inductors and Transformers; Delay Lines; Connectors and Interconnection Devices; Switches; Relays and Contactors; Wire and Cable; Discrete Semiconductors; Integrated Circuits; Sources of Information, Specifications and Parts; plus Standards/Trade Organizations.

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Model 2630

1.05-GHz Spectrum Analyzer

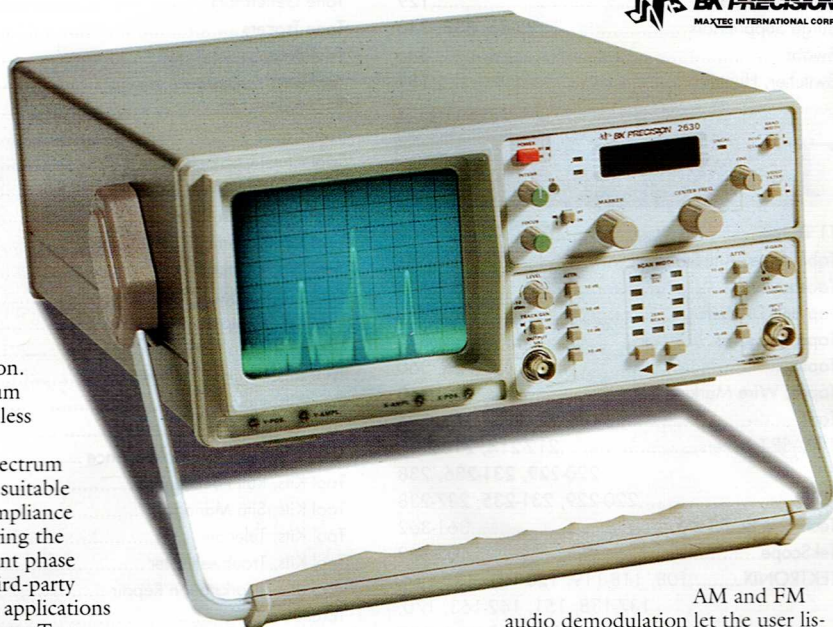
- Top performance, not price
- Dynamic range 80 dB (113 dB with attenuation)
- AM and FM demodulation included
- 20- and 400-kHz resolution bandwidth
- 150-kHz per hour stability
- Built-in tracking generator

This new B+K 1.05-GHz Spectrum Analyzer provides the performance and important features needed for a wide variety of applications at previously unheard of low prices. Model 2630 offers the stability and dynamic range of models costing thousands of dollars more. It can measure low amplitude signals with a measurement range of over 113 dB (-100 dBm to +13 dBm) with 80 dB being displayed on the screen at 10 dB/division. Maximum input level is +20 dBm. Finding a more stable spectrum analyzer at any price is difficult. The 2630 is guaranteed to drift less than 0.150 MHz per hour.

2630 Specifications

FREQUENCY	
Frequency Range	0.15 MHz-1050 MHz (-3 dB)
Center Frequency	±100 kHz
Display Accuracy	
Marker Accuracy	±(0.1% span + 100 kHz)
AMPLITUDE	
Amplitude Range	-100 dBm to +13 dBm
Screen Display Range	80 dB (10 dB/div)
Reference Level Accuracy	±2 dB
INPUT	
Input Impedance	50 Ω
Input Connector	BNC
DISPLAY	
	6" crt, 8 x 10 div. internal graticule
TRACKING GENERATOR	
Output Level Range	-50 dBm to +1 dBm (in 10 dB steps and var.)

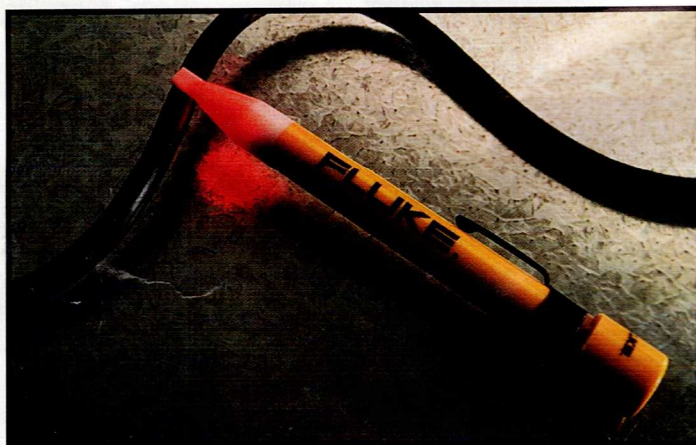
This spectrum analyzer is suitable for pre-compliance testing during the development phase prior to third-party testing. Its applications are numerous. Test cable TV levels and frequency response plus master antenna TV systems. Also use the Model 2630 to measure spurious and unwanted emissions, locate sources of EMI and measure unwanted RF radiation.



AM and FM audio demodulation let the user listen to and identify RF signals. The tracking generator has a range of 1050 MHz. Output level is adjustable from -50 dBm to +1 dBm in four 10-dB switchable steps in addition to an 11-dB rotary variable attenuator control. Fine and coarse center frequency controls combined with a scanwidth selector enable simple frequency domain measurements of 100 kHz/div to 100 MHz/div. A 4.5-digit numeric LED readout can display center or marker frequency selectively.

Includes power cord and instruction manual. The 15.4-pound unit measures 4.9" x 11.2" x 15". One-year warranty.

110X750 2630 Spectrum Analyzer...1-2, \$3385.00 ea.; 3-up, \$3225.00 ea.



Model 1AC-A1 VoltAlert™

AC Voltage Detector

- Test line voltage with easy-to-use detector
- Fits in a shirt pocket for convenience

Model 1AC-A1 VoltAlert™ is the new pocket-sized ac line voltage detector from Fluke. Easy to use, just touch the tip to an outlet or cord. When it glows red, you know voltage is in the line. Electricians, maintenance, service and safety personnel can quickly test for energized circuits and defective grounds on the factory floor, in the shop or at home.

All outer surfaces are non-conductive for safety. Detects voltage without metallic contact. Probe is composed of injection-molded high-impact non-flammable PVC and ABS.

Specifications include: safety symbols (UL, CSA and TÜV on packaging; UL and CSA on product); safety standards (ANSI/ISA -S82.01-94 and IEC1010-1, -2, CAT III, 600 V ac); operating range (90-600 V ac).

Powered by two AAA alkaline batteries. This unit is 5.75" long x .75" diameter and weighs 1.5 ounces with batteries. One-year warranty.

045X090 1AC-A1 VoltAlert...1-9, \$19.95 ea.; 10-up, \$18.95 ea.

Model 7-300 and 7-600 Electrical Testers

Automatic Volts AC/DC, Continuity and Ohms

- Exceptional value and ease of use
- Ideal for basic electrical testing

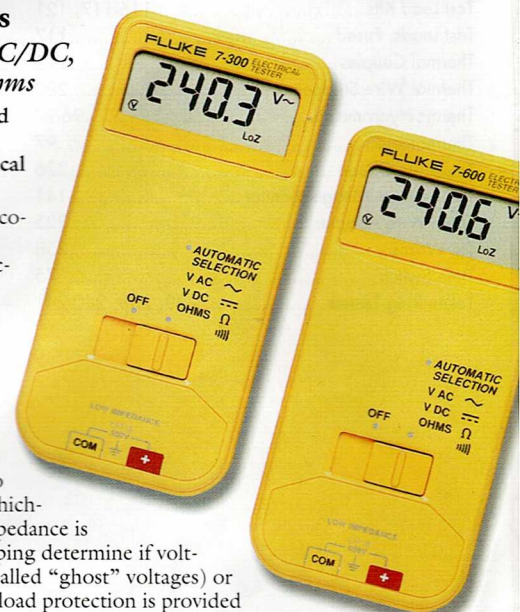
The new Fluke 7 is economical and easy to use. Automatic function selection simplifies voltage measurements in power environments. When measuring ohms/continuity with more than 4.5 volts present across the input jacks (intentional or not), the meter automatically switches to measuring ac or dc V, whichever is greater. Input impedance is approximately 2 kΩ, helping determine if voltage is from leakage (so-called "ghost" voltages) or a hard connection. Overload protection is provided if the circuit is checked on ohms mode. Automatic readings of V ac and V dc are 300 V max for Model 7-300 and 600 V max for the 7-600. Features 4000-count digital display, continuity beeper and 400-Ω range.

Specifications include: safety symbols (CE, UL, CSA, TÜV); safety standards (IEC 1010.1, 300 V CAT III for 7-300, 600 V CAT III for 7-600).

High-visibility yellow plastic housing is easy to locate on the job or in your toolbox. Alkaline battery life is 650 hours continuous. Includes TL-75 test leads. The 10-ounce unit is 5.6" x 2.8" x 1.4". Two-year warranty.

045X230 7-300 Electrical Tester...1-5, \$49.00 ea.; 6-up, \$46.50 ea.

045X240 7-600 Electrical Tester...1-5, 69.00 ea.; 6-up, 65.50 ea.



FLUKE



Payment Options

Company Purchase Order

We welcome company purchase orders from established firms. When placing your order, please include your purchase order number, complete shipping and billing addresses plus the name and phone number of the person authorizing the purchase. We can usually open a new account within 24 hours.

C.O.D.

We will ship C.O.D. to established firms only (no personal C.O.D.s). All shipping charges plus a C.O.D. charge of \$5 per box will be added to the cost of your order. Our policy is to call within 24 hours of shipment to notify you of the exact charges because they can't always be determined prior to shipment. In some instances, we may require a cashier's check for payment.

Payment in Advance

Organizations or persons making initial purchases from us should include full payment with their order. Don't forget to add \$14.95 for shipping and any applicable sales tax (California, Colorado, Connecticut, Florida, Georgia, Illinois and Texas residents only). The \$5 handling charge applies only to orders under \$50.

Credit Cards

Specialized Products Company accepts MasterCard, Visa and American Express. When placing your order, please furnish credit card number, expiration date and telephone number. For your convenience, please use the order form found in this catalog when using your credit card. Or for fastest service, call (800) 866-5353 and your order will be shipped immediately.

General Information

Payment Terms

To make ordering from us as easy as possible, we offer a variety of payment options for both recognized firms as well as individual purchasers. Please include full payment (check or money order only) with your order. Don't forget to add the appropriate sales tax (CA, CO, CT, FL, GA, IL and TX only) or furnish us your tax exemption certificate. We also ship open account (net 30 days only) to qualified Dunn & Bradstreet/TRW-rated firms using company purchase order numbers and can accommodate C.O.D. orders. Or you may use your credit cards.

Handling Charge

We have no minimum order, but all orders totalling less than \$50 are subject to a nominal \$5 handling charge.

Returns and Claims

Should a problem arise with any product purchased from us, we ask only that you contact our Customer Service Department at (800) 866-5353 as soon as possible to obtain a return authorization number prior to returning any merchandise to us. This will ensure that your problem is handled quickly and to your complete satisfaction. We want you to be happy with every purchase!

Prices

All prices are net industrial prices. We offer quantity price breaks on most items, and extra discounts can be obtained for large quantity purchases. Please contact our Sales Department for more information. All prices are subject to change — please contact our Sales Department at (800) 866-5353 to verify current pricing.

Product Guarantee


We stand behind everything we sell. If for any reason you are not completely happy with your purchase, simply return it to us within 30 days, and we will exchange it or refund your money — period. No exceptions! We ask only that you contact our Customer Service Department to obtain a Return Authorization Number (RMA) before actually sending it back and that you return it to us in its original packaging with a copy of the packing list or invoice so we can make sure that we handle it to your complete satisfaction.

Additionally, every product you purchase from us carries a full factory warranty that guarantees your purchase for an additional period of time up to 90 days, one year, five years or even a lifetime (depending on the product and the manufacturer)! Please refer to the specific product information or contact our Customer Service Department at (800) 866-5353 for more information concerning the exact duration and any possible limitations of individual factory warranties.

Overnight Delivery

\$14.95

Gets Most Orders There the Next Day!





That's right, for only \$14.95 we'll ship your order today for NEXT-DAY delivery by 3 p.m. That's any size order for anywhere in the U.S. A \$20 surcharge will be added for orders to AK and HI. If overnight delivery is not available to your area, we'll do the next best thing and get it to you by the second business day. A few items in our catalog cannot be shipped overnight under our \$14.95 plan because of size restrictions or Federal regulations that may require special handling. These few items are indicated by an  notation for Surface Freight Only. If you have a requirement to ship one of these items overnight, please contact our Sales Department at (800) 866-5353 for more information.



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Federal Express

***For fastest service,
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\$14.95 OVERNIGHT DELIVERY Here's How It Works!

-  Call or FAX your order before 4:30 p.m. CST any weekday.
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-  Your order arrives before 3 p.m. the next business day!

IMPORTANT:

Need Saturday delivery?
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Call for information:
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